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MAS report on airborne exposures from sawing asb. cont. resin pipe

1. hand-sawing 1.6-5.4 f/cc
2. elec. saw (1) 71-106 f/cc
   (2) 53-149 f/cc

ATLANTA
Corporate Headquarters
3945 Lakefield Court
Suwanee, GA 30024
(770) 866-3200 FAX (770) 866-3259



Cutting of an Asbestos-Containing Resin Based Pipe: A Work Practice Study

Materials Analytical Services, LLC

September 2010

Cutting of an Asbestos-Containing Resin Based Pipe: A Work Practice Study

1 Protocol

2 Summary of Air Sampling Data and PCM Images

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SECTION 1

Cutting of an Asbestos-Containing Resin Based Pipe: A Work Practice Study

Protocol

September 27, 2010

Overview:

On February 19, 2007 Materials Analytical Services (MAS) received a molded resin based flange with a small piece of pipe from Motley Rice Law Firm. According to the documentation the flange/pipe sample had been sent to them by the law firm of Riggs Abney & Turpen. MAS was requested to conduct a work practice study with this pipe by the Lanier Law Firm.

The study was designed to measure any airborne asbestos fiber levels during the cutting of the pipe section using various cutting tools. This work practice was divided into three studies. Study 1 will consist of cutting a small section of the pipe with a fine tooth hand saw. Study 2 will cut another small section of the pipe with an electric powered hand saw with a fine tooth blade. Study 3 will consist of cutting a small section of the pipe using an electric powered hand saw equipped with a masonry blade.

Cutting of the Asbestos-Containing Resin Based Pipe

I. ECL Set-Up

A. Study is to be performed in the MAS exposure characterization lab (ECL) constructed using negative airflow asbestos abatement technology. The size of the ECL is approximately 15' x 20' x 8'. The ECL will be decontaminated before the study.

B. Air exchange inside the ECL during the work phases will be approximately 200 cubic feet per minute as measured at 10' (in middle of 12" ID duct) from the air exhaust of the HEPA filter negative air machine (Force Air 2000 EC).

C. High intensity lighting setup will be in general accordance with the methods described in D.T. Chambers, "Asbestos", John Wiley & Sons, 6, 193, 1983 and the Environmental Protection Agency SOP, EPA-Libby-02, Revision #1, March 2001 (Tyndall lighting section only), and the MDHS # 82, "The Dust



Lamp", March 1997. The high intensity lighting source will consist of three high intensity light (1000 watts ellipsoidal pyrex lens, 219K candle power, 8 degree beam angle) located on each side of the worktable at a height of approximately 5.5 feet from the floor and approximately 7 feet from the work activity.

Study 1: Hand Sawing

II. Background, Area & Personal Air Samples

A. Before the hand sawing work practice study takes place, background air samples will be run in the ECL.

B. Adjust and calibrate high volume area pumps to approximately 10.0 liters per minute.

C. Set up four area air samples inside the ECL. Use 25 mm air cassettes containing 0.8 micron pore size mixed cellulose ester (MCE) filters with a 5.0 micron backing pad.

D. Locate the background air samples in each quadrant of the ECL at a height of 5.5 feet from the floor and a distance of approximately six feet from the work activity.

E. During this study the four area samples located in each quadrant will be calibrated and run at a rate of approximately 10.0 liters/minute. These area air samples will be set up as described in section II of this protocol.

F. The investigator will be fitted with four personal air pumps and air cassettes (two on each shoulder) located in his breathing zone and calibrated at a flow rate of approximately 2.0 to 3.5 liters/minute.

Hand Sawing Work Practice

G. For this work practice the investigator will use a 13" PVC/ABS plastic pipe saw (Buck Bros.) to cut a ¼" to ½" section off the pipe taken at the end of the pipe. The air sampling information will be recorded on the IH air sampling chain of custody sheets for the study.

H. The investigator will wear appropriate protective clothing, work apparel and air supplied respiratory protection equipment.

I. The work practice will be performed under both ambient and high intensity lighting.

J. The entire procedure will be videotaped with two separate cameras (Sony Handycam, model numbers HDR-HC3 and DCR-HC). During filming the high intensity lighting will be turned off and overhead lights turned on several times during the study.

K. Fabric work clothes samples will be collected off of the investigator after each phase of the study has been completed.

L. The field blanks will be opened inside the ECL for 30 seconds after each phase of the study has been completed.

Study 2: Electric Sawing 7¼ Inch Plywood Blade

III. Background, Area & Personal Air Samples

A. Before the hand sawing work practice study takes place, background air samples will be run in the ECL. Since this study will be run after the hand sawing study, the ECL's ventilation will be elevated prior to the collection of the background samples for Study 2. The ventilation rate will be increased to 2000 cubic feet per minute for approximately 30 minutes.

B. For the background samples adjust and calibrate high volume area pumps to approximately 10.0 liters per minute and the background air samples will be run for approximately one hour.

C. Set up four area air samples inside the ECL. Use 25 mm air cassettes containing 0.8 micron pore size mixed cellulose ester (MCE) filters with a 5.0 micron backing pad.

D. Locate the background air samples in each quadrant of the ECL at a height of 5.5 feet from the floor and a distance of approximately six feet from the work activity.

E. During this study the four area samples located in each quadrant will be calibrated and run at a rate of approximately 2.0 liters/minute. These area air samples will be set up as described above.

F. The investigator will be fitted with four personal air pumps and air cassettes (two on each shoulder) located in his breathing zone and calibrated at a flow rate of approximately 0.5 liters/minute.

Study 2: Electric Saw Work Practice

G. For Study 2 the investigator will use a Skil 2.4 hp 7¼ inch circular saw with a 7¼ inch plywood metal blade (Avanti) to cut a ¼" to ½" section off the pipe taken at the end of the pipe. The air sampling information will be recorded on the IH air sampling chain of custody sheets for the study.

H. The investigator will wear appropriate protective clothing, work apparel and air supplied respiratory protection equipment.

I. The work practice will be performed under both ambient and high intensity lighting.

J. The entire procedure will be videotaped with two separate cameras (Sony Handycam, model numbers HDR-HC3 and DCR-HC). During filming the high intensity lighting will be turned off and overhead lights turned on several times during the study.

K. Fabric work clothes samples will be collected off of the investigator after each phase of the study has been completed.

L. The field blanks will be opened inside the ECL for 30 seconds after each phase of the study has been completed.

Study 3: Electric Sawing-Work Practice

IV. Background, Area & Personal Air Samples

A. Before the second electric sawing work practice study takes place, background air samples will be run in the ECL. Since this study will be run after the Study 2 electric sawing study, the ECL's ventilation will be elevated prior to the collection of the background samples for Study 3. The ventilation rate will be increased to 2000 cubic feet per minute for approximately 30 minutes.

B. For the background samples adjust and calibrate high volume area pumps to approximately 10.0 liters per minute and the background air samples will be run for approximately one hour.

C. Set up four area air samples inside the ECL. Use 25 mm air cassettes containing 0.8 micron pore size mixed cellulose ester (MCE) filters with a 5.0 micron backing pad.

D. Locate the background air samples in each quadrant of the ECL at a height of 5.5 feet from the floor and a distance of approximately six feet from the work activity.

E. During this study the four area samples located in each quadrant will be calibrated and run at a rate of approximately 2.0 liters/minute. These area air samples will be set up as described above.

F. The investigator will be fitted with four personal air pumps and air cassettes (two on each shoulder) located in his breathing zone and calibrated at a flow rate of approximately 0.5 liters/minute.

Study 3: Electric Saw Work Practice

G. For this work practice the investigator will use a Skil 2.4 hp 7¼ inch circular saw with a 7⅛ inch DeWalt masonry blade to cut a ¼" to ½" section off the pipe taken at the end of the pipe. The air sampling information will be recorded on the IH air sampling chain of custody sheets for the study.

H. The investigator will wear appropriate protective clothing, work apparel and air supplied respiratory protection equipment.

I. The work practice will be performed under both ambient and high intensity lighting.

J. The entire procedure will be videotaped with two separate cameras (Sony Handycam, model numbers HDR-HC3 and DCR-HC). During filming the high intensity lighting will be turned off and overhead lights turned on several times during the study.

K. Fabric work clothes samples will be collected off of the investigator after each phase of the study has been completed.

L. The field blanks will be opened inside the ECL for 30 seconds after each phase of the study has been completed.

V. Laboratory Analysis

A. All air sample cassettes will be analyzed by the NIOSH 7400 PCM method using A counting rules and all personal air samples and 50% of the area samples will be analyzed by the NIOSH 7402 TEM method.

B. Fabric samples from the work clothing will be analyzed by the recommended EPA method.

SECTION 2

Asbestos-Containing Resin Based Pipe

Study 1: Hand Sawing
M51855

Background Air Samples

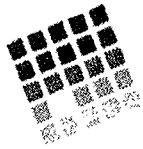
Sample No.	Sample Description	PCM Fibers/cc	NIOSH 7402	PCME Fibers/cc
A-01-A	IWA	<0.001	0%	
A-01-B	IWA	<0.001	0%	
A-01-C	IWA	<0.001		
A-01-D	IWA	<0.001		

Personal Air Samples

Sample No.	Sample Description	PCM Fibers/cc	NIOSH 7402	PCME Fibers/cc
P-1-A	Personal PLR	5.36	97%	5.20
P-1-B	Personal PLL	1.66	92%	1.53
P-1-C	Personal PLR	4.87		
P-1-D	Personal PLL	2.48		

Area Air Samples

Sample No.	Sample Description	PCM Fibers/cc	NIOSH 7402	PCME Fibers/cc
A-1-A	IWA	1.7		
A-1-B	IWA	1.4		
A-1-C	IWA	1.2		
A-1-D	IWA	1.3		



Asbestos-Containing Resin Based Pipe

Study 2: Electric Saw, Fine Toothed Blade
M51857

Background Air Samples

Sample No.	Sample Description	PCM Fibers/cc	NIOSH 7402	PCME Fibers/cc
A-02-A	IWA	<0.006		
A-02-B	IWA	<0.006		
A-02-C	IWA	0.006		
A-02-D	IWA	<0.006		

Personal Air Samples

Sample No.	Sample Description	PCM Fibers/cc	NIOSH 7402	PCME Fibers/cc
P-2-A	Personal PLR	71.2	100%	71.2
P-2-B	Personal PLL	106.1		
P-2-C	Personal PLR	101.3		
P-2-D	Personal PLL	89.4		

Area Air Samples

Sample No.	Sample Description	PCM Fibers/cc	NIOSH 7402	PCME Fibers/cc
A-2-A	IWA	50.5		
A-2-B	IWA	46.2		
A-2-C	IWA	49.2		
A-2-D	IWA	71.0		

Asbestos-Containing Resin Based Pipe

Study 3: Electric Saw, Masonry Blade
M51863

Background Air Samples

Sample No.	Sample Description	PCM Fibers/cc	NIOSH 7402	PCME Fibers/cc
A-03-A	IWA	0.011		
A-03-B	IWA	<0.027		
A-03-C	IWA	0.014		
A-03-D	IWA	0.008		

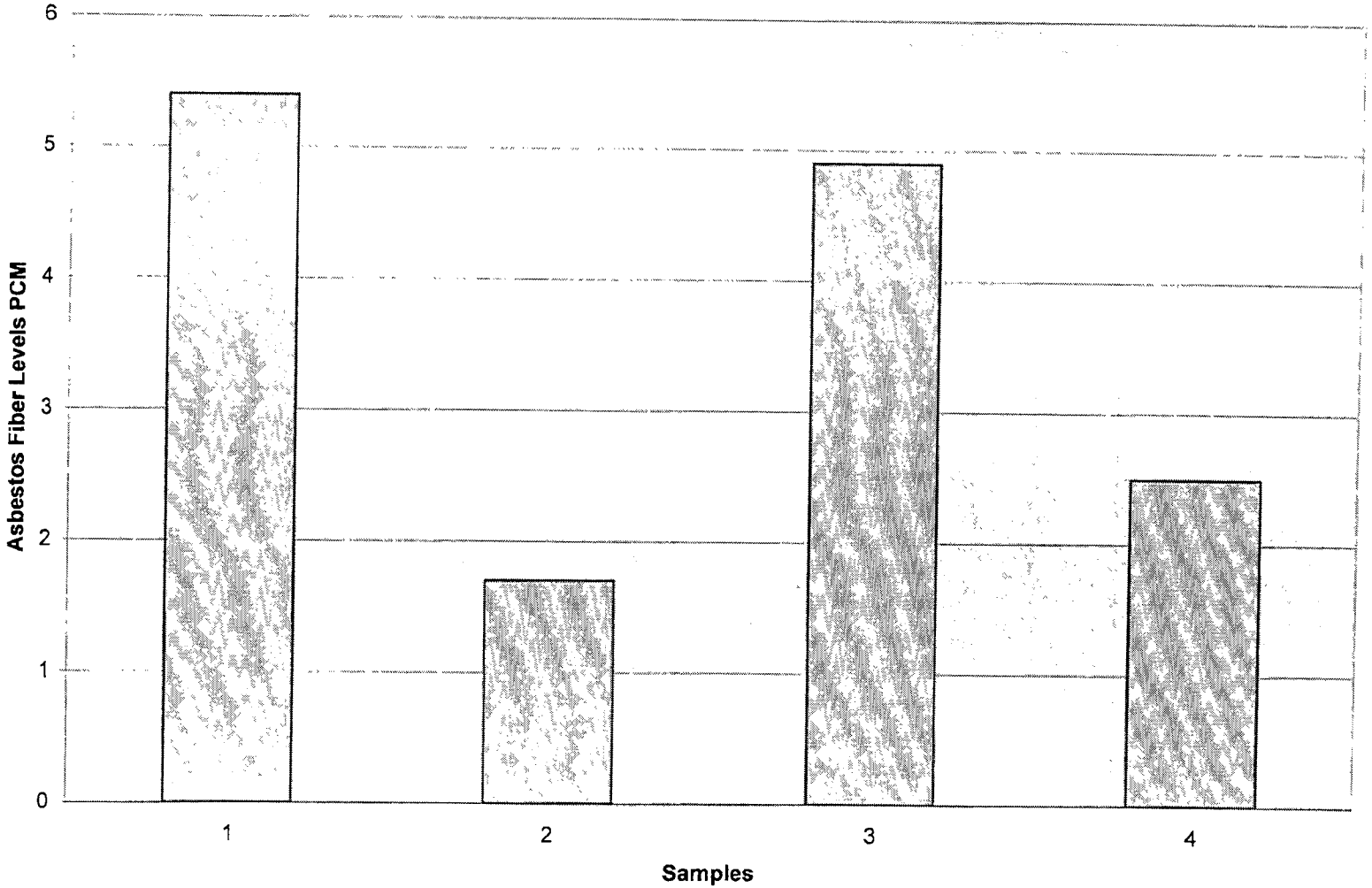
Personal Air Samples

Sample No.	Sample Description	PCM Fibers/cc	NIOSH 7402	PCME Fibers/cc
P-3-A	Personal PLR	88.8	100%	88.8
P-3-B	Personal PLL	137.9		
P-3-C	Personal PLR	148.7		
P-3-D	Personal PLL	52.6		

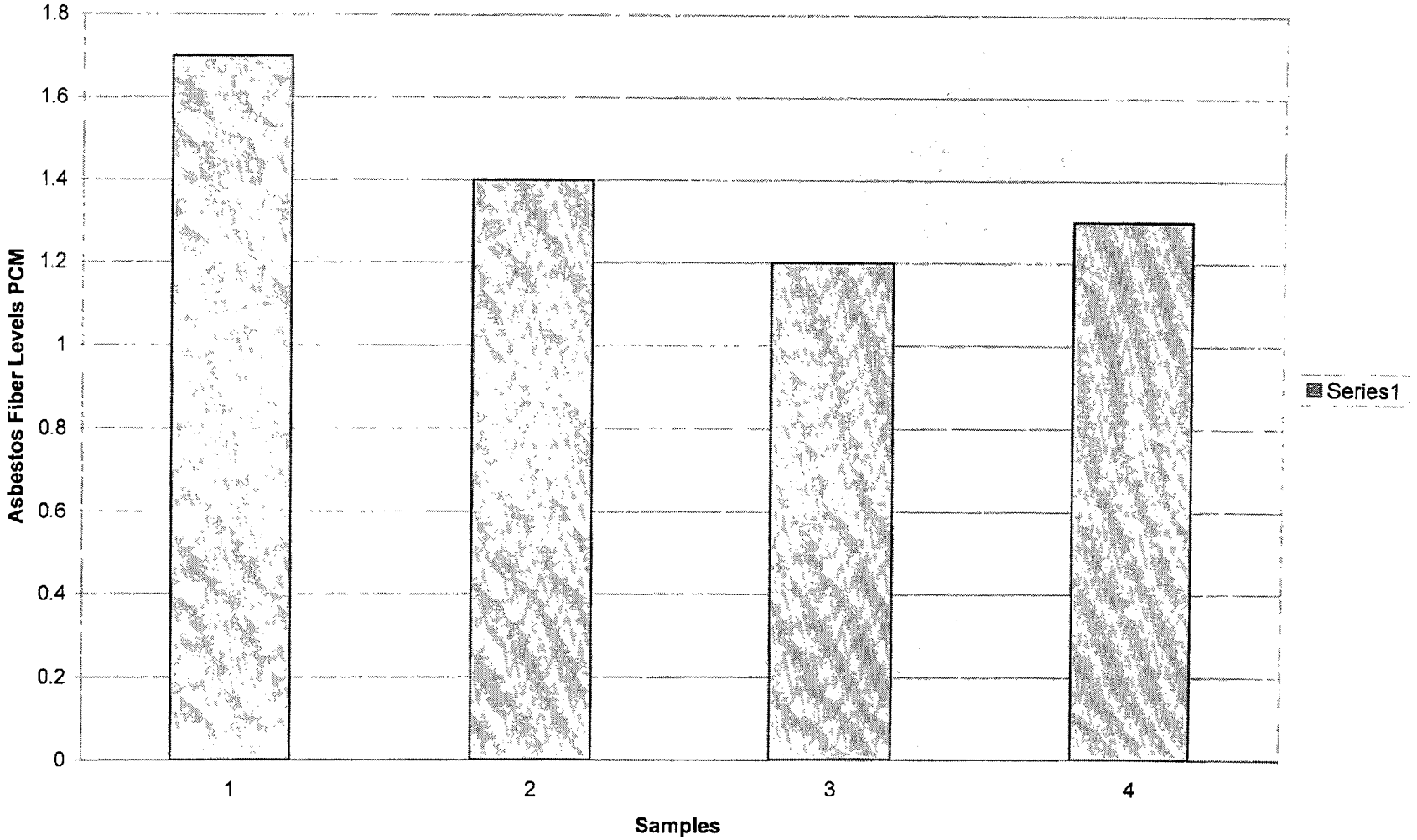
Area Air Samples

Sample No.	Sample Description	PCM Fibers/cc	NIOSH 7402	PCME Fibers/cc
A-3-A	IWA	82.5		
A-3-B	IWA	61.5		
A-3-C	IWA	90.3		
A-3-D	IWA	82.0		

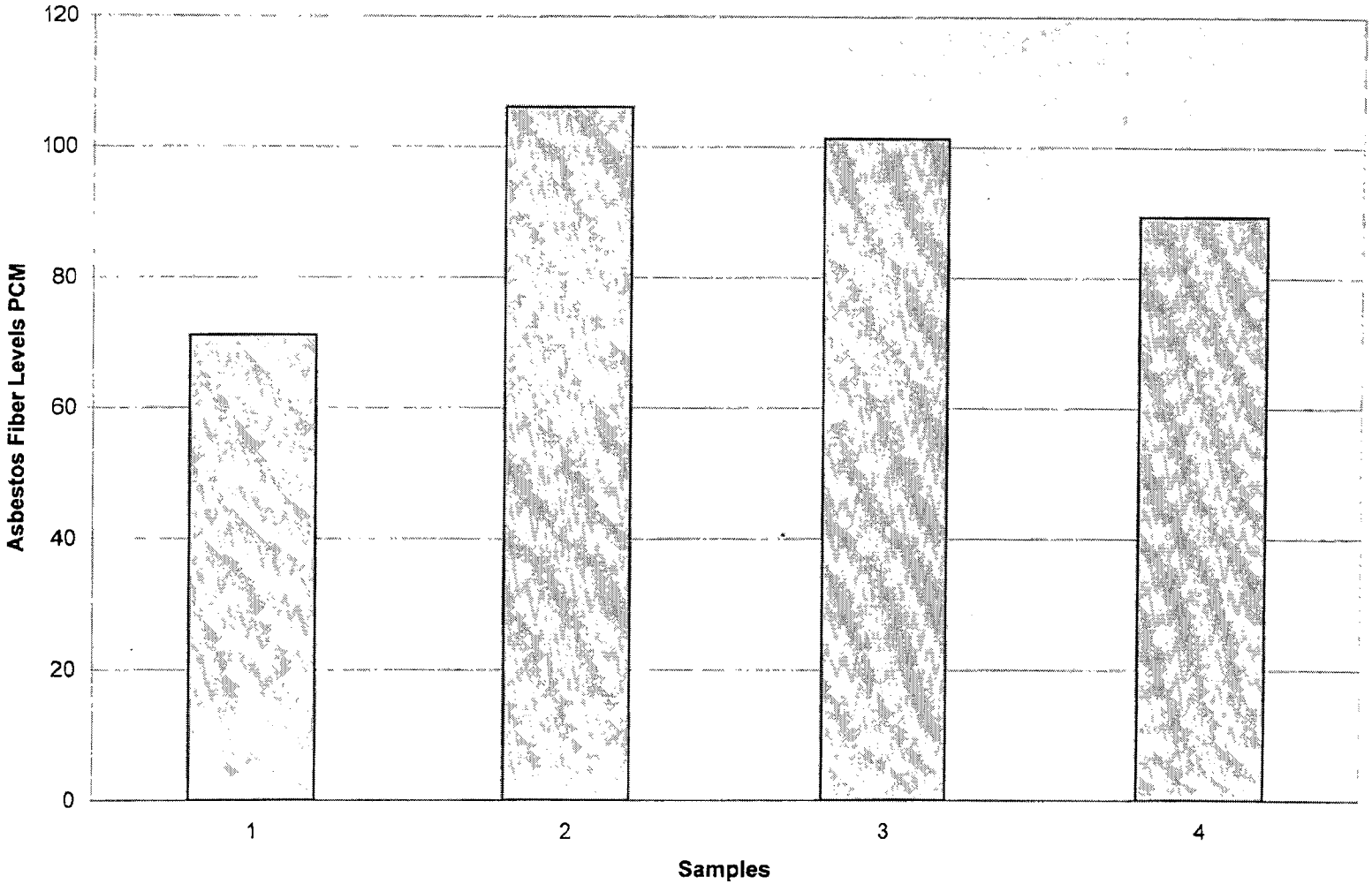
Hand Sawing Personal Samples Study I



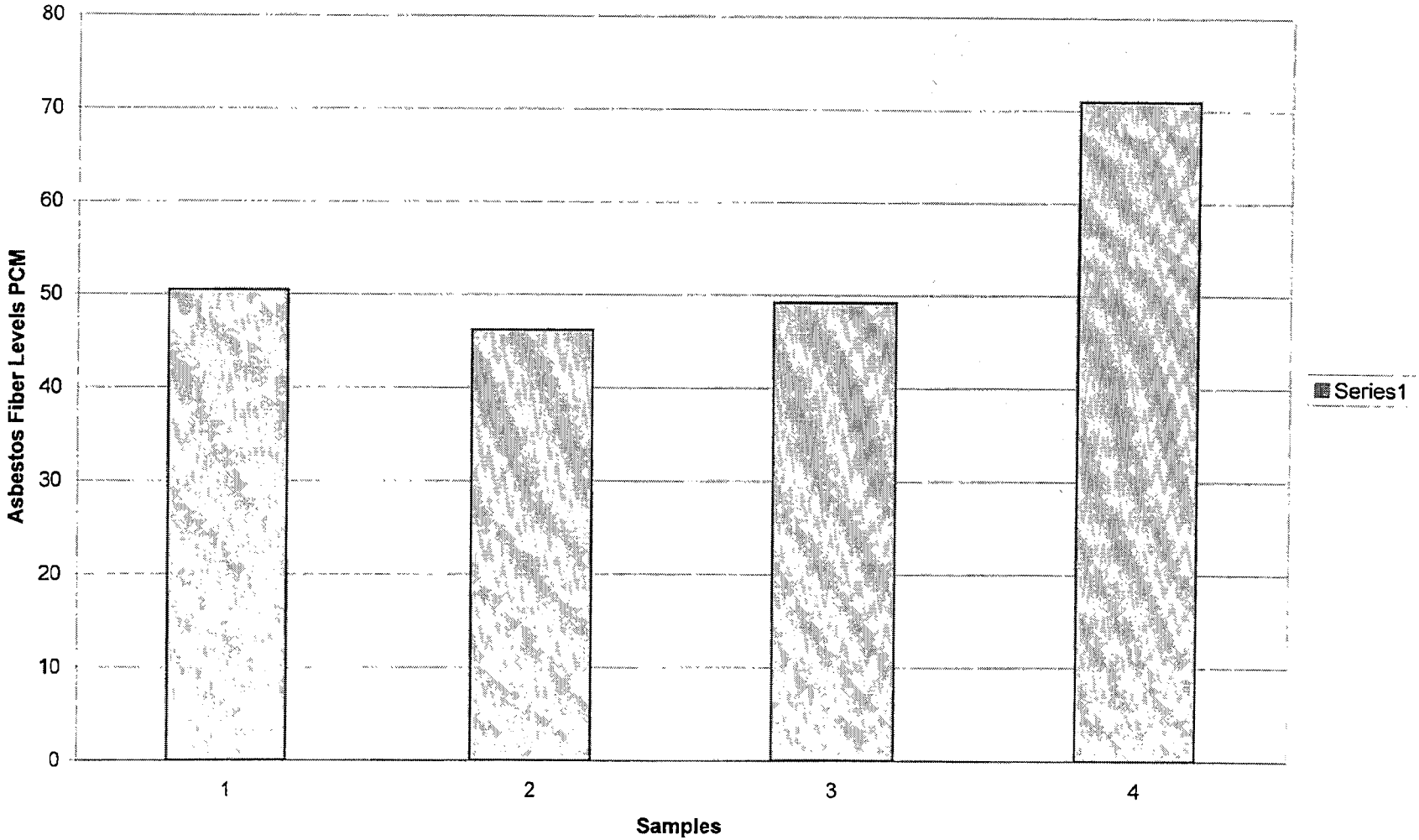
Area Samples Hand Sawing Study I



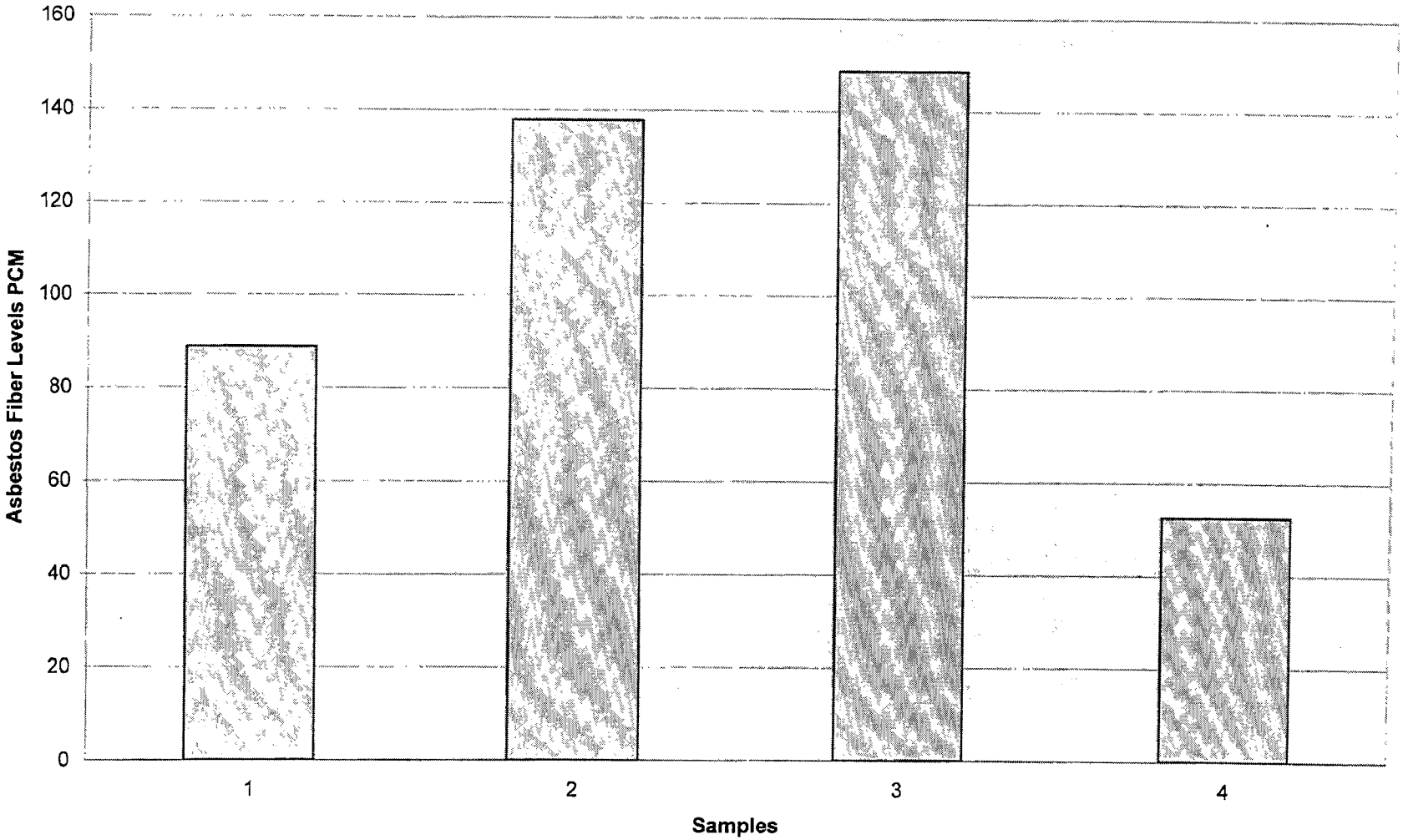
Power Sawing With Fine Saw Blade Personal Samples Study II



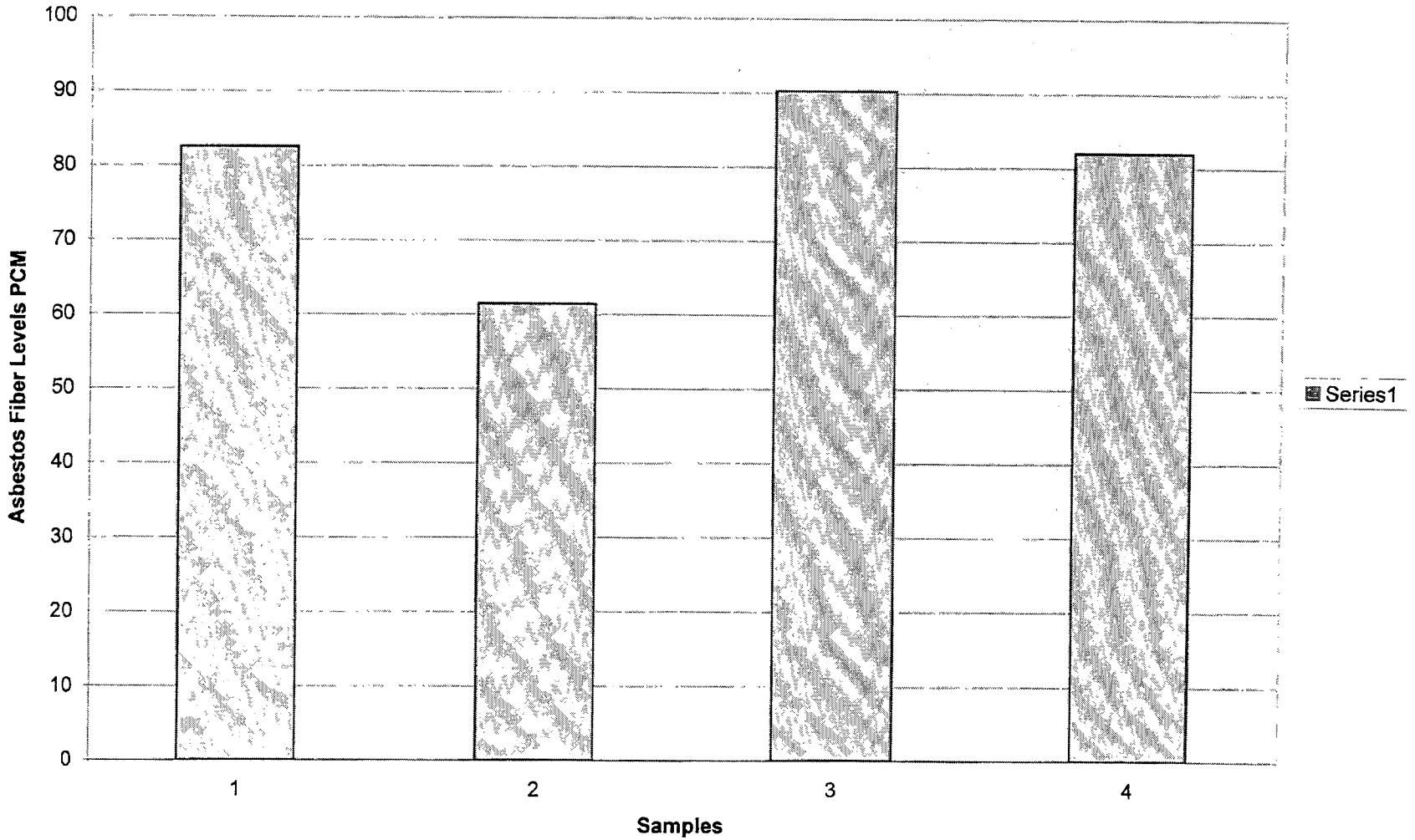
Power Sawing With Fine Tooth Saw Blade Area Samples Study II

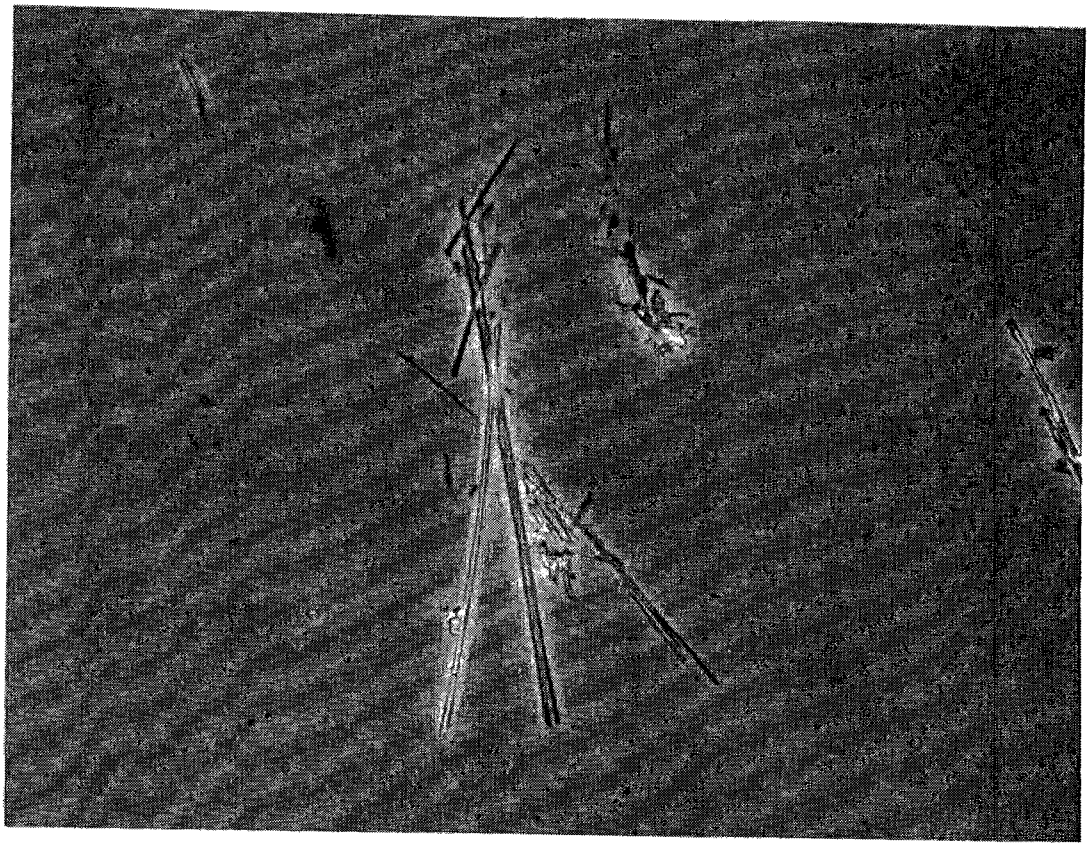


Power Sawing Masonry Blade Personal Samples Study III

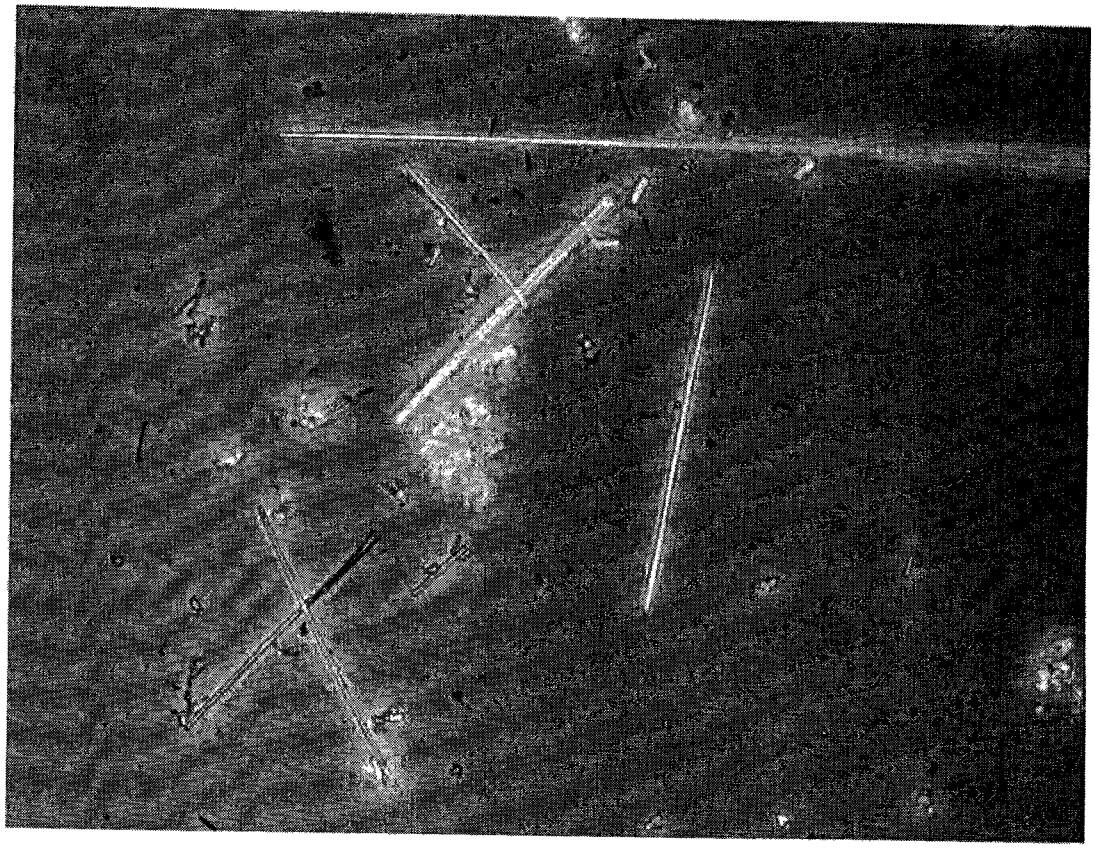


Electric Sawing With A Masonry Blade Area Samples

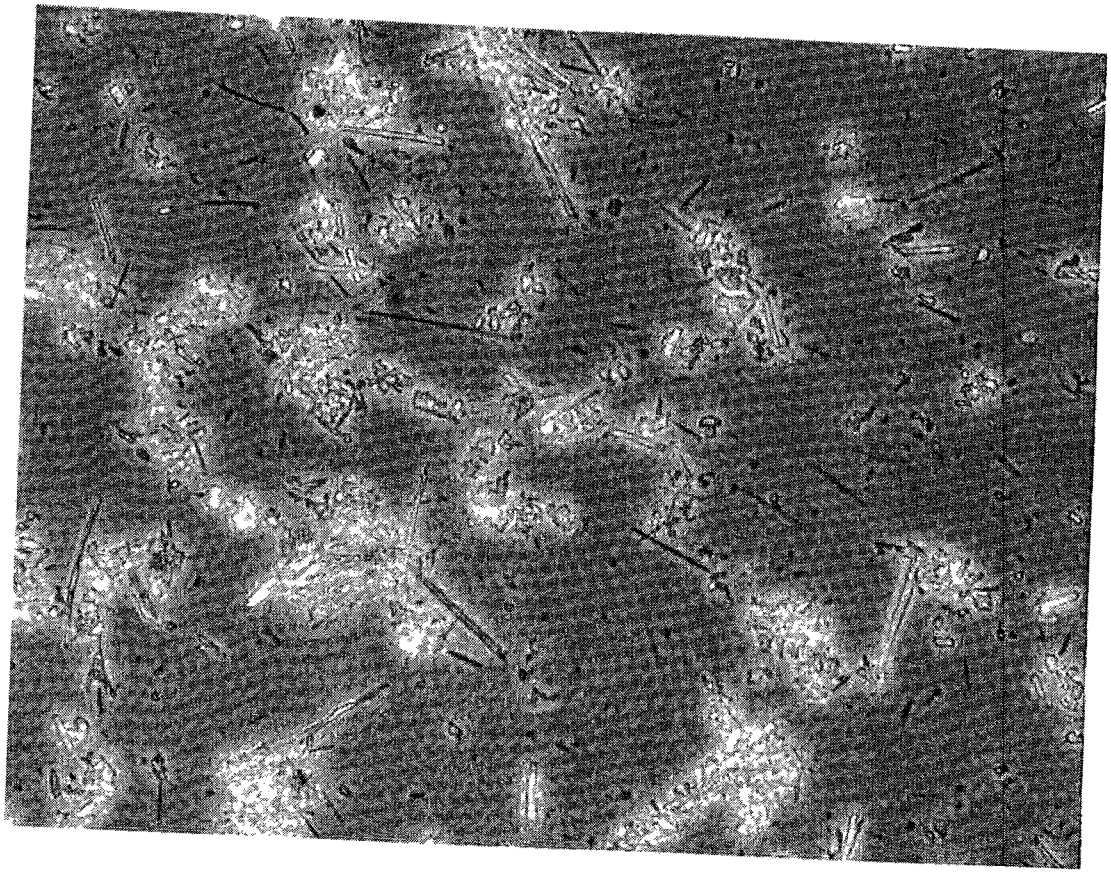




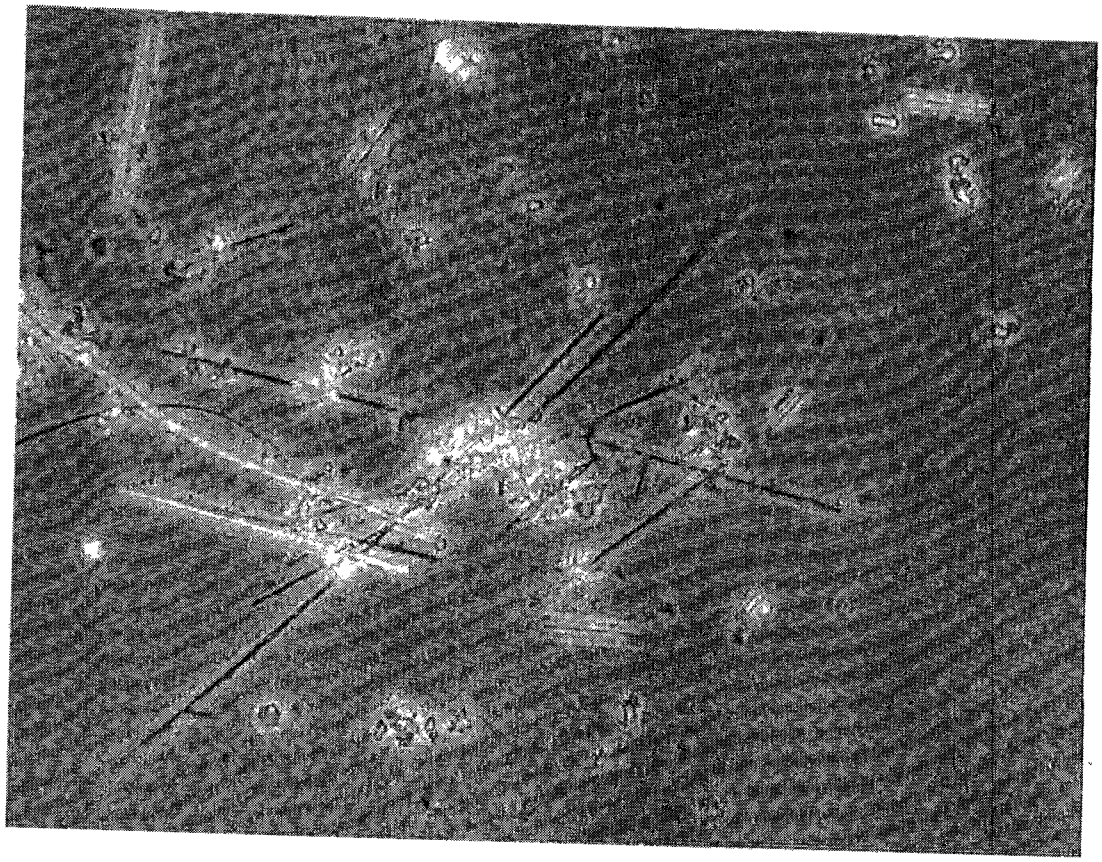
M51855-012 A-1-D



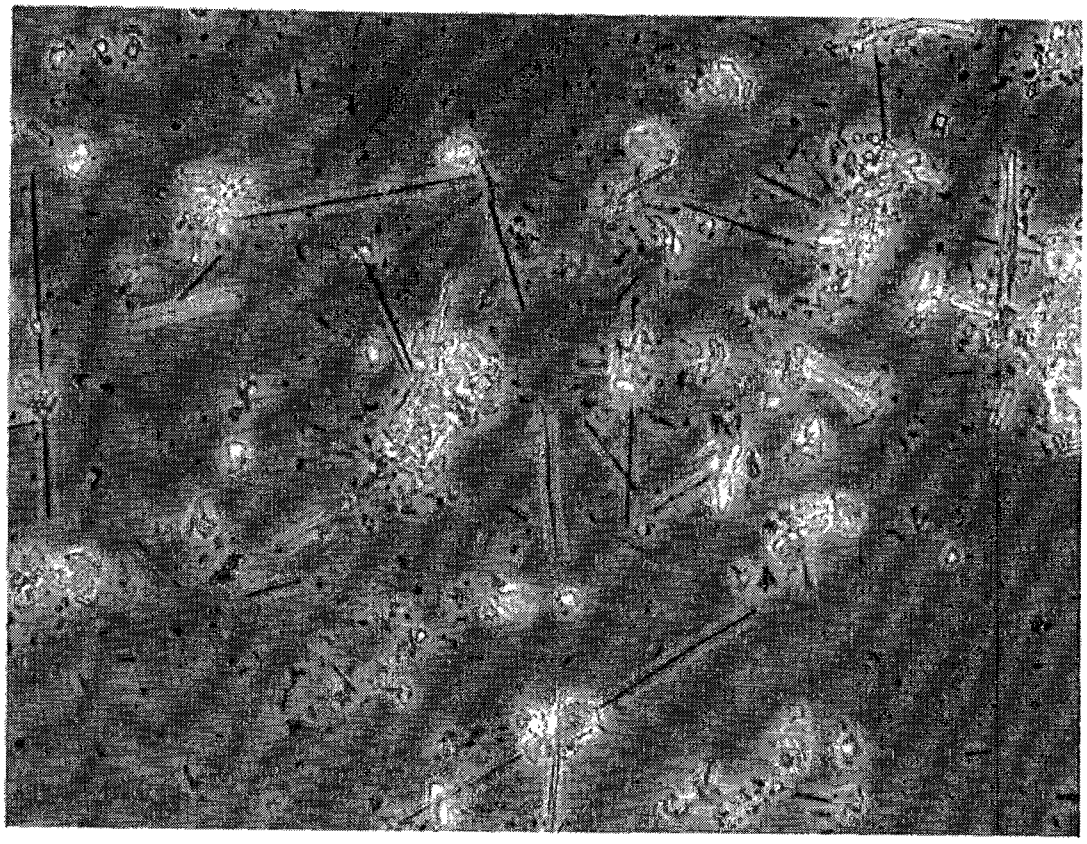
M51857-006 P-2-B



M51857-012 A-2-D



M51863-005 P-3-A



M51863-010 A-3-B

SECTION 3

MAS, LLC.
CHAIN-OF-CUSTODY

CLIENT: Motley Rice LLC
CONTACT: Wm. Michael Gruenloh
PHONE: (843) 216-9563
CLIENT JOB NAME: Lathum-Ameron-Asbestos
CLIENT JOB#:
CLIENT DOC(S): Letter of transmittal
FAX NUMBER: (843) 216-9430

MAS JOB: M42122
DATE RECEIVED: 2/19/2007
SUBMITTED BY: Wm. Michael Gruenloh
TRANSPORT: FedEx
RECEIVED BY: Nancy Sears
CONDITION: samples not sealed

MAS #	CLIENT ID	VOLUME	TYPE MATERIAL	MAS #	CLIENT ID	VOLUME	TYPE MATERIAL
001	asbestos mat						
LOCATION							
002	rope-like yarn						
LOCATION							
003	resin base flange						
LOCATION							
004	resin base flange						
LOCATION							

SAMPLE RECEIVED BY: Nancy Sears DATE: 2/19/07

COMMENT:

MAS, LLC.
3945 Lakefield Court
Suwanee, Georgia 30024
(770) 866-3200

m42122

MotleyRice

Wm. Michael Gruenloh
Licensed in SC
Direct Dial 843.216.9563
Direct Fax 843.216.9430
MGruenloh@motleyrice.com

February 16, 2007

William Longo, Ph.D.
Materials Analytical Services
3945 Lakefield Court
Suwanee, GA 30024

Re: Wilda Jean Lathum, Widow of Jerry H. Lathum, Deceased

Dear Dr. Longo:

Enclosed please find a sample of the asbestos mat that was manufactured at Ameron's Ardmore Oklahoma facility where Jerry Lathum worked. Also enclosed are: (a) One roll of small rope-like yarn purportedly used as a gap filler prior to gluing flanges together. We suspect this may be crocidolite. (b) Two fiberglass-composite flanges. We suspect these may contain Union Carbide Calidria Resin Grade asbestos. As we discussed we would like you to analyze these samples and provide us with your opinion on the content and exposure given the attached testimony regarding the manufacture and use of the materials by Mr. Lathum.

Testimony has been given stating that Ameron used raw blue asbestos fiber and ore at their facility in Ardmore, OK in the manufacture of the aforementioned asbestos mat. Inside the facility, Ameron employed the use of a hammer mill to crush the raw asbestos ore and fiber. This hammer mill was not closed off from the rest of the facility. Witnesses have stated that there was a cloud of dust surrounding the hammer mill and that asbestos dust would hang from the rafters like Spanish moss. Jerry Lathum worked for Ameron from 1963 until 1971 performing various duties. At the time of his departure from Ameron, Lathum worked in Quality Control and performed his duties throughout the plant. I have also included a diagram of the facility. The dimensions are approximate. There are no enclosed partitions between areas.

This case is scheduled to go to trial on September 10, 2007. Expert reports are due April 16, 2007 and I expect defense will want to take your deposition sometime before May 16, 2007 (deadline for expert discovery). Please call me if you wish to discuss this case.

Respectfully,

Wm. Michael Gruenloh

WMG/sci
cc: Dick Gann

rec'd Sears 2/19/07

MAS, LLC
PLM ANALYSIS

Proj#-Spl# M42122 - 001 **Analyst** W.B. Egeland **Date** 5/1/2007

ClientName Motley Rice LLC **ClientSpl** asbestos mat

Location

Type_Mat

Gross Visual Blueish compressed fibrous mat. Orange granular silt and woody debris observed.

OPTICAL DATA FOR ASBESTOS IDENTIFICATION

Morphology	Straight
Pleochroism	blue/gray
Refract Index	1.690/1.682
Sign^	negative
Extinction	parallel
Birefringence	low
Melt	no
Fiber Name	Crocidolite

ASBESTOS MINERALS	**EST. VOL. %**
Chrysotile	
Amosite	
Crocidolite	100
Tremolite/Actinolite	
Anthophyllite	

OTHER FIBROUS COMPONENTS

NON FIBROUS COMPONENTS

Binder Description

Comments Orange granular silt and woody debris observed.

The method detection limit is 1% unless otherwise stated.

MAS, LLC
PLM ANALYSIS

Proj#-Spl# M42122 - 002 **Analyst** W.B. Egeland **Date** 5/1/2007

ClientName Motley Rice LLC **ClientSpl** rope-like yarn

Location

Type_Mat

Gross Visual Light blue yarn of blue fibers/bundles

OPTICAL DATA FOR ASBESTOS IDENTIFICATION

Morphology	Straight		
Pleochroism	blue/gray		
Refract Index	1.690/1.682		
Sign^	negative		
Extinction	parallel		
Birefringence	low		
Melt	no		
Fiber Name	Crocidolite		

ASBESTOS MINERALS	**EST. VOL. %**
Chrysotile	
Amosite	
Crocidolite	100
Tremolite/Actinolite	
Anthophyllite	

OTHER FIBROUS COMPONENTS

NON FIBROUS COMPONENTS

Binder Description

Comments

The method detection limit is 1% unless otherwise stated.

MAS, LLC
PLM ANALYSIS

Proj#-Spl# M42122 - 003 **Analyst** W.B. Egeland **Date** 5/1/2007

ClientName Motley Rice LLC **ClientSpl** resin base flange

Location

Type_Mat

Gross Visual Broken 1/2 blueish "T" flange of compressed blue and white fibers/bundles with scattered black flakes, dark damaged area observed.

OPTICAL DATA FOR ASBESTOS IDENTIFICATION

Morphology	Straight	straight	
Pleochroism	blue/gray	none	
Refract Index	1.690/1.682	1.620/1.605	
Sign^	negative	positive	
Extinction	parallel	parallel	
Birefringence	low	moderate	
Melt	no	no	
Fiber Name	Crocidolite	Anthophyllite	

ASBESTOS MINERALS	EST. VOL. %
Chrysotile	
Amosite	
Crocidolite	40
Tremolite/Actinolite	
Anthophyllite	20

OTHER FIBROUS COMPONENTS

NON FIBROUS COMPONENTS

Mica	3
Binder	37

Binder Description Amorphous material and non-fibrous accessory minerals

Comments

The method detection limit is 1% unless otherwise stated.

MAS, LLC
PLM ANALYSIS

Proj#-Spl# M42122 - 004 **Analyst** W.B. Egeland **Date** 5/1/2007

ClientName Motley Rice LLC **ClientSpl** resin base flange

Location

Type_Mat

Gross Visual Blueish "T" flange of compressed blue and white fibers/bundles with scattered black flakes, dark damaged area observed.

OPTICAL DATA FOR ASBESTOS IDENTIFICATION

Morphology	Straight	straight	
Pleochroism	blue/gray	none	
Refract Index	1.690/1.682	1.620/1.605	
Sign^	negative	positive	
Extinction	parallel	parallel	
Birefringence	low	moderate	
Melt	no	no	
Fiber Name	Crocidolite	Anthophyllite	

ASBESTOS MINERALS	**EST. VOL. %**
Chrysotile	
Amosite	
Crocidolite	40
Tremolite/Actinolite	
Anthophyllite	20
OTHER FIBROUS COMPONENTS	
NON FIBROUS COMPONENTS	
Mica	3
Binder	37

Binder Description Amorphous material and non-fibrous accessory minerals

Comments

The method detection limit is 1% unless otherwise stated.

ANALYSIS BY
CHATFIELD METHOD

Project #: M42122 Sample #: 004 Analyst: WB Egeland

Vial #: Date: 9/27/2010

MUFFLE FURNACE ASHING RESULTS

Vial weight (A)		13.6595
Vial weight plus sample weight (B)		13.8686
Original sample weight (B-A)	(W1)	0.2091
Weight of vial and sample after ashing (C)		13.7887
Sample weight after ashing (C-A)	(W2)	0.1292

Acid Dissolution Results (After Muffle Furnace Ashing)

Polycarbonate filter weight (D)		0.0160
Filter plus dry sample weight (E)		0.1412g
Sample weight after acid dissolution (E-D)	(W3)	0.1252g
Percent weight of organic material ((W1-W2)/(W1))*100		38.2%
Percent weight of dolomite/calcite ((W2-W3)/(W1))*100		1.9%
Estimated upper and lower percent asbestos by TEM scan	Upper	85%
	Lower	65%
Percent weight of asbestos (W3/W1)*Lower to (W3/W1)*Upper		38.9 to 50.9%

SECTION 4

MAS, LLC.
PROJECT COC

MAS ID:	M51855	**Client Job No:**	
Client Name:	Materials Analytical Services Atlanta	**Client PO:**	
Project Name:	ECL AC Resin Pipe Cutting Hand Saw Stu	**Date In:**	9/28/2010
Logged By:	ddmount	**Client Code:**	MASCORP

TRANSPORT INFORMATION:

Submitted By:	Michael Mount, CIH	**Documents:**	COC
Delivery By:	Hand Delivery		
Received By:	Nancy Sears	**Comments for COC:**	
Condition:	good		

CONTACT INFORMATION:

Contact:	Bill Longo			**Work Phone:** (770) 866-3200	**Ext:**
Title:	**First Name:**	**Last Name:**	**Suffix**	**Other Phone:**	**Ext:**
Mr.	William	Longo		**Fax:** (770) 866-3259	

SAMPLE INFORMATION:

#	Client ID	Volume	#	Client ID	Volume
000	lab blank	0			
001	A-01-A	1704.3			
002	A-01-B	1696.7			
003	A-01-C	1715.7			
004	A-01-D	1719.5			
005	P-1-A	20.1			
006	P-1-B	21			
007	P-1-C	33			
008	P-1-D	32.3			
009	A-1-A	90.7			
010	A-1-B	89.5			
011	A-1-C	89.3			
012	A-1-D	90			
013	A-1-E	1160			
014	FB-1-1	0			
015	FB-1-2	0			

SIGNATURES

RECEIVED BY: Nancy Sears

Page 1 of 1

225 CFM
74° F
62% RH

INDUSTRIAL HYGIENE AIR SAMPLING CHAIN OF CUSTODY

MAS

3945 Lakefield Court
Suwanee, GA 30024
Phone: 770-866-3200
Fax: 770-866-3259

COMPANY NAME: MAS LLC, Dept 14
ADDRESS:
PHONE:
FAX:

PROJECT NUMBER:
PROJECT NAME: AC Resin Pipe Cutting, Hand Saw; Study 1
WORK AREA DESCRIPTION: ECL
PROJECT REPRESENTATIVE: Mike Mount
SAMPLING DATE: 9/27/10

m5 1855

TURNAROUND TIMES: _____ 1 DAY _____ 3 DAYS _____ STANDARD 5 –7 DAYS

DATE	SAMPLE NUMBER	SAMPLE LOCATION	SAMPLE MEDIA	ANALYSIS DESIRED	START TIME	STOP TIME	TOTAL TIME MINUTES	PRE FLOW RATE LPM	POST FLOW RATE LPM	AVG. FLOW RATE LPM	Total Volume Liters
9/27	A-01-A	Background, NE	0.8um MCE	7400, 7402	6:35	9:45	190	8.9	9.04	8.97	1704.3
	B	" SE		7402				8.9	8.95	8.93	1696.7
	C	" SW						9.1	8.95	9.03	1715.7
	D	" NW						9.1	8.99	9.05	1719.5
	P-1-A	Personal, On Worker, R		7402	12:12	12:22	10	2.05	1.97	2.01	20.1
	B	" L		7402				2.10	2.10	2.10	21.0
	C	" R						3.41	3.36	3.39	33.9
	D	" L						3.33	3.12	3.23	32.3
	A-1-A	Area, During Cut, NE		7402				9.04	9.10	9.07	90.7
	B	" SE		7402				8.95	8.94	8.95	89.5
	C	" SW						8.95	8.91	8.93	89.3
	D	" NW						8.99	9.00	9.00	90.0
	E	" Outside ECL			11:03	1:07	116	10.0	10.0	10.0	1160.0
	FB-1-1	Field Blank - 1		7402			0			0	0
	FB-1-2	" - 2		7402			0			0	0
		m51856									
	FAB-1-1	Fabric - Before	~~EPA~~ Fabric (Shirt)	EPA Fabric Method							
	FAB-1-2	" - After									

CHAIN OF CUSTODY	NAME	COMPANY	MODE OF TRANSFER	LOG IN DATE	RECEIVED BY	COMPANY
First Transfer by:	Mike Mount	MAS, LLC	Hand	9-28-10	N. Sears	MAS
Second Transfer by:						
Third Transfer by:						

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

AC Resin Pipe Cutting, Study 1 -

MAS Project: Hand Saw MAS Sample #: M51855-001

Client Sample ID: A-01-A Analysis Date: 9/28/10

0	0	0	0	0	0	
0	0	0	0	0	0	10
0	0	0	0	0	0	
0	0	0	0	0	0	20
1.5	0	0	0.5	0	1	
0	0	0	0	0	0	30
0	0	0	0	0	0	
0	0	0	0	0	0	40
0	0	0	0	0	0	
0	0	0	0	0	0	50
0	0	0	0	0	0	
0	0	0	0	0	0	60
0	0	0	0	0	0	
0	0	0	0	0	0	70
0	0	0	0	0	0	
0	0	0	0	0	0	80
0.5	0	0	0	0	0.5	
0	0	0	0	0	0	90
0	0	0	0	0	0	
0	0	0	0	0	0	100
2.0	0	0	0.5	0	1.5	2.0

Pump Flow Rate, Liters/Minute (FR)	8.97
Sample Time, Minutes (T)	190
Total Sample Volume, Liters (V)	1704.3
Total Fibers Counted, Sample (FCS)	2
Total Fields Counted, Samples (FLS)	100
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 2.5 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= < 0.002 fibers/cm^3

Notes:

Media Type: 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased.

Analyst: W. B. Egeland Date: 9/28/2010

Reviewed By: M. Mount Date: 10/1/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

AC Resin Pipe Cutting, Study 1 -

MAS Project: Hand Saw MAS Sample #: M51855-002

Client Sample ID: A-01-B Analysis Date: 9/28/10

0	0	0	0	0	0	
0	0	0	0	0	0	10
0	0	0	0	0	0	
0	0	0	0	0	0	20
1	0	0	1	0	0	
0	0	0	0	0	0	30
0	0	0	0	0	0	
0	0	0	0	0	0	40
0	0	0	0	0	0	
0	0	0	0	0	0	50
2	0	1	0	1	0	
0	0	0	0	0	0	60
0	0	0	0	0	0	
0	0	0	0	0	0	70
0	0	0	0	0	0	
0	0	0	0	0	0	80
0	0	0	0	0	0	
0	0	0	0	0	0	90
0	0	0	0	0	0	
0	0	0	0	0	0	100
3.0	0	1	1	1	0	3.0

Pump Flow Rate, Liters/Minute (FR)	8.93
Sample Time, Minutes (T)	190
Total Sample Volume, Liters (V)	1696.7
Total Fibers Counted, Sample (FCS)	3.0
Total Fields Counted, Samples (FLS)	100
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 3.8 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= < 0.002 fibers/cm^3

Notes:

Media Type: 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased.

Analyst: W. B. Egeland Date: 9/28/2010

Reviewed By: M. Mount Date: 10/1/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

AC Resin Pipe Cutting, Study 1 -

MAS Project: Hand Saw MAS Sample #: M51855-003

Client Sample ID: A-01-C Analysis Date: 9/28/10

0	0	0	0	0	0	
0	0	0	0	0	0	10
0	0	0	0	0	0	
0	0	0	0	0	0	20
0	0	0	0	0	0	
0	0	0	0	0	0	30
0.5	0.5	0	0	0	0	
0	0	0	0	0	0	40
0	0	0	0	0	0	
0.5	0	0	0	0.5	0	50
0	0	0	0	0	0	
0	0	0	0	0	0	60
1	1	0	0	0	0	
0	0	0	0	0	0	70
0	0	0	0	0	0	
0	0	0	0	0	0	80
0	0	0	0	0	0	
0	0	0	0	0	0	90
0	0	0	0	0	0	
0	0	0	0	0	0	100
2.0	1.5	0	0	0.5	0	2.0

Pump Flow Rate, Liters/Minute (FR)	**190**
Sample Time, Minutes (T)	**9.03**
Total Sample Volume, Liters (V)	**1715.7**
Total Fibers Counted, Sample (FCS)	**2.0**
Total Fields Counted, Samples (FLS)	100
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted; Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 2.5 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= < 0.002 fibers/cm^3

Notes:

Media Type: 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased

Analyst: W. B. Egeland Date: 9/28/2010

Reviewed By: M. Mount Date: 10/1/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

AC Resin Pipe Cutting, Study 1 -

MAS Project: Hand Saw MAS Sample #: M51855-004

Client Sample ID: A-01-D Analysis Date: 9/28/10

0	0	0	0	0	0	
0	0	0	0	0	0	10
0	0	0	0	0	0	
0	0	0	0	0	0	20
0	0	0	0	0	0	
0	0	0	0	0	0	30
0	0	0	0	0	0	
0	0	0	0	0	0	40
0	0	0	0	0	0	
0.5	0	0	0.5	0	0	50
0	0	0	0	0	0	
0	0	0	0	0	0	60
0	0	0	0	0	0	
0	0	0	0	0	0	70
0	0	0	0	0	0	
0	0	0	0	0	0	80
0	0	0	0	0	0	
0	0	0	0	0	0	90
0	0	0	0	0	0	
0	0	0	0	0	0	100
0.5	0	0	0.5	0	0	0.5

Pump Flow Rate, Liters/Minute (FR)	190
Sample Time, Minutes (T)	9.05
Total Sample Volume, Liters (V)	1719.5
Total Fibers Counted, Sample (FCS)	0.5
Total Fields Counted, Samples (FLS)	100
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 0.6 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= < 0.002 fibers/cm^3

Notes:

Media Type: 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased.

Analyst: W. B. Egeland Date: 9/28/2010

Reviewed By: M. Mount Date: 10/1/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

AC Resin Pipe Cutting, Study 1 -

MAS Project: Hand Saw MAS Sample #: M51855-005

Client Sample ID: P-1-A Analysis Date: 9/28/10

15.5	3	1	2	8.5	1	
9.5	0.5	3	1	1	4	10
7.5	2.5	0	0	1	4	
11	0	2	5	3	1	20
6	0	1	1	2	2	
12	1	1.5	1	7	1.5	30
8.5	0	3	3.5	2	0	
18	0	5.5	1	5.5	6	40
11	2	2	4.5	1.5	1	
2	2					50
0						
0						60
0						
0						70
0						
0						80
0						
0						90
0						
0						100
101.0	11	19	19	31.5	20.5	101.0

Pump Flow Rate, Liters/Minute (FR)	10
Sample Time, Minutes (T)	2.01
Total Sample Volume, Liters (V)	20.1
Total Fibers Counted, Sample (FCS)	101
Total Fields Counted, Samples (FLS)	46
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 279.7 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= 5.36 fibers/cm^3

Notes:

Media Type: 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased.

Analyst: W. B. Egeland Date: 9/28/2010

Reviewed By: M. Mount Date: 10/1/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

AC Resin Pipe Cutting, Study 1 -

MAS Project: Hand Saw MAS Sample #: M51855-006

Client Sample ID: P-1-B Analysis Date: 9/28/10

1	0	1	0	0	0	
3	0	1	2	0	0	10
5	4	0	1	0	0	
0	0	0	0	0	0	20
7	1	1	2	3	0	
1	0	0	1	0	0	30
0	0	0	0	0	0	
6	1	0	3	1	1	40
4.5	0.5	0	4	0	0	
4.5	2	0	0	2	0.5	50
5	0.5	1	1	2	0.5	
4	0.5	0	3.5	0	0	60
1.5	0	0	0.5	0	1	
4.5	1	1	0	2	0.5	70
2	2	0	0	0	0	
5.5	2.5	0	0	3	0	80
3.5	0	1	0	0	2.5	
6	3.5	0	1	1.5	0	90
2	0	0	1	0	1	
4.5	0	0.5	1	0	3	100
70.5	18.5	6.5	21	14.5	10	70.5

Pump Flow Rate, Liters/Minute (FR)	2.1
Sample Time, Minutes (T)	10
Total Sample Volume, Liters (V)	21.0
Total Fibers Counted, Sample (FCS)	70.5
Total Fields Counted, Samples (FLS)	100
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 89.8 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= 1.65 fibers/cm^3

Notes:

Media Type: 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased.

Analyst: W. B. Egeland Date: 9/28/2010

Reviewed By: M. Mount Date: 10/1/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

AC Resin Pipe Cutting, Study 1 -

MAS Project: Hand Saw MAS Sample #: M51855-007

Client Sample ID: P-1-C Analysis Date: 9/28/10

24.5	1	9	10	4	0.5	
14.5	0	6.5	4.5	1	2.5	10
14.5	3.5	3	1	4.5	2.5	
22.5	5	2	8.5	1	6	20
10	0	2	2	2	4	
15	1	5.5	4	2.5	2	30
0						
0						40
0						
0						50
0						
0						60
0						
0						70
0						
0						80
0						
0						90
0						
0						100
101.0	10.5	28	30	15	17.5	101.0

Pump Flow Rate, Liters/Minute (FR)	**3.39**
Sample Time, Minutes (T)	**10**
Total Sample Volume, Liters (V)	**33.9**
Total Fibers Counted, Sample (FCS)	**101**
Total Fields Counted, Samples (FLS)	30
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	30
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 428.9 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= 4.87 fibers/cm^3

Notes:

Media Type. 25 mm MCE Filter

Limit of Quantitation (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased.

Analyst: W. B. Egeland Date: 9/28/2010

Reviewed By: M. Mount Date: 10/1/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

AC Resin Pipe Cutting, Study 1 -

MAS Project: Hand Saw MAS Sample #: M51855-008

Client Sample ID: P-1-D Analysis Date: 9/28/10

9.5	3.5	0	3	1	2	
8	0	2	1	5	0	10
1	1	0	0	0	0	
17	1	0	1	11	4	20
9.5	4	3.5	0	1	1	
6	1.5	2.5	1	1	0	30
4	0	1	3	0	0	
10	0	2	1	6	1	40
9.5	1	0	4	2.5	2	
5.5	1.5	2	0	2	0	50
11	1.5	1	6	1	1.5	
5.5	2	1	2	0.5	0	60
6.5	0	0.5	6			
0						70
0						
0						80
0						
0						90
0						
0						100
103.0	17	15.5	28	31	11.5	103.0

Pump Flow Rate, Liters/Minute (FR)	3.23
Sample Time, Minutes (T)	10
Total Sample Volume, Liters (V)	32.3
Total Fibers Counted, Sample (FCS)	103
Total Fields Counted, Samples (FLS)	63
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 208.3 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= 2.48 fibers/cm^3

Notes:

Media Type. 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased.

Analyst: W. B. Egeland Date: 9/28/2010

Reviewed By: M. Mount Date: 10/1/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

AC Resin Pipe Cutting, Study 1 -

MAS Project: Hand Saw MAS Sample #: M51855-009

Client Sample ID: A-1-A Analysis Date: 9/28/10

13	3.5	4.5	2	0.5	2.5	
4.5	2	1	0	0	1.5	10
17.5	2.5	9.5	0	0	5.5	
16.5	0.5	6.5	0.5	0.5	8.5	20
20.5	1	11.5	1	2	5	
17.5	7	2.5	3	4	1	30
12	3	9				
0						40
0						
0						50
0						
0						60
0						
0						70
0						
0						80
0						
0						90
0						
0						100
101.5	19.5	44.5	6.5	7	24	101.5

Pump Flow Rate, Liters/Minute (FR)	**9.07**
Sample Time, Minutes (T)	**10**
Total Sample Volume, Liters (V)	90.7
Total Fibers Counted, Sample (FCS)	**101.5**
Total Fields Counted, Samples (FLS)	32
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 404.1 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= 1.72 fibers/cm^3

Notes:

Media Type: 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased.

Analyst: W. B. Egeland Date: 9/28/2010

Reviewed By: M. Mount Date: 10/1/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

AC Resin Pipe Cutting, Study 1 -

MAS Project: Hand Saw MAS Sample #: M51855-010

Client Sample ID: A-1-B Analysis Date: 9/28/10

11.5	0	4	3.5	0	4	
22	0.5	1	13.5	5	2	10
10	0	1	2.5	1	5.5	
9.5	0.5	2	5	2	0	20
5	0	0	1	3	1	
14.5	1	3	5	2.5	3	30
14.5	0.5	1	1	0	12	
8	4.5	2.5	1	0	0	40
6.5	6.5					
0						50
0						
0						60
0						
0						70
0						
0						80
0						
0						90
0						
0						100
101.5	13.5	14.5	32.5	13.5	27.5	101.5

Pump Flow Rate, Liters/Minute (FR)	**10**
Sample Time, Minutes (T)	**8.95**
Total Sample Volume, Liters (V)	**89.5**
Total Fibers Counted, Sample (FCS)	**101.5**
Total Fields Counted, Samples (FLS)	41
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 315.4 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= 1.36 fibers/cm^3

Notes:

Media Type: 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased.

Analyst: W. B. Egeland Date: 9/28/2010

Reviewed By: M. Mount Date: 10/1/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

AC Resin Pipe Cutting, Study 1 -

MAS Project: Hand Saw MAS Sample #: M51855-011

Client Sample ID: A-1-C Analysis Date: 9/28/10

4	3	1	0	0	0	
12.5	4	0	0	1	7.5	10
11	0	0	3.5	2.5	5	
8	1	3	0.5	0.5	3	20
7	0.5	0	0.5	4	2	
9	1.5	0	0	6.5	1	30
15.5	0	4.5	4.5	1	5.5	
5	1	3.5	0	0	0.5	40
11	1.5	0.5	2	3.5	3.5	
18.5	16	2.5				50
0						
0						60
0						
0						70
0						
0						80
0						
0						90
0						
0						100
101.5	28.5	15	11	19	28	101.5

Pump Flow Rate, Liters/Minute (FR)	**8.93**
Sample Time, Minutes (T)	**10**
Total Sample Volume, Liters (V)	89.3
Total Fibers Counted, Sample (FCS)	101.5
Total Fields Counted, Samples (FLS)	47
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 275.1 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= 1.19 fibers/cm^3

Notes:

Media Type: 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased.

Analyst: W. B. Egeland Date: 9/28/2010

Reviewed By: M. Mount Date: 10/1/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

AC Resin Pipe Cutting, Study 1 -

MAS Project: Hand Saw MAS Sample #: M51855-015

Client Sample ID: FB-1-2 Analysis Date: 9/28/10

0	0	0	0	0	0	
0	0	0	0	0	0	10
0	0	0	0	0	0	
0	0	0	0	0	0	20
0	0	0	0	0	0	
0	0	0	0	0	0	30
0	0	0	0	0	0	
0	0	0	0	0	0	40
0	0	0	0	0	0	
0	0	0	0	0	0	50
0	0	0	0	0	0	
0	0	0	0	0	0	60
0	0	0	0	0	0	
0	0	0	0	0	0	70
0	0	0	0	0	0	
0	0	0	0	0	0	80
0	0	0	0	0	0	
0	0	0	0	0	0	90
0	0	0	0	0	0	
0	0	0	0	0	0	100
0.0	0	0	0	0	0	0.0

Pump Flow Rate, Liters/Minute (FR)	0
Sample Time, Minutes (T)	0
Total Sample Volume, Liters (V)	0
Total Fibers Counted, Sample (FCS)	0
Total Fields Counted, Samples (FLS)	100
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= < 7.0 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= NA fibers/cm^3

Notes:

Media Type: 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased.

Analyst: W. B. Egeland Date: 9/28/2010

Reviewed By: M. Mount Date: 10/1/2010

MAS TEM ANALYSIS M51855-001

CLIENT NAME: Materials Analytical Services Atlanta CLIENT SAMPLE ID: A-01-A

7402 ANALYSIS

Sample Area/ Volume:	1704.3	Liters	Date Analyzed:	10/4/2010
Filter Type:	MCE 25mm		Analyst:	A.Keeton
Pore size:	0.8		Scope Number:	2
Effective Filter Area:	385		Accelerating Voltage:	100 KV
Sample type:	Air		Indicated Mag:	25 KX
Analysis type:	7402		Screen Mag:	20 KX
Grid Acceptance	YES	3 %	Grid_box:	7707

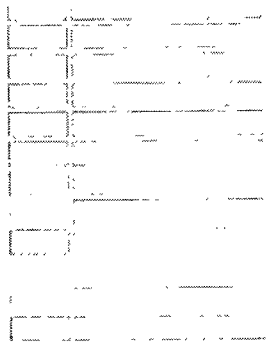
Number of grids: 3 #1: 110 #3: 110
Number of openings: 40 #2: 111 #4: 111
Average Grid Size: 0.012210 Total Area Analyzed: 0.488

Asbestos 0
Non-asbestos 0

% Asbestos 0

Str#	SquareID	Fiber Type	Size	Morph	SAED	EDS
NSD	C6-B1					
NSD	B2					
NSD	B3					
NSD	B4					
NSD	B5					
NSD	B6					
NSD	E7					
NSD	E8					
NSD	E9					
NSD	E10					
NSD	G4					
NSD	G5					
NSD	G6					
NSD	G7					
NSD	G8					
NSD	G9					
NSD	G10					
NSD	I5					
NSD	I6					
NSD	I7					
NSD	C7-B4					
NSD	B5					
NSD	B6					
NSD	B7					
NSD	B8					
NSD	B9					
NSD	B10					
NSD	H6					

NSD	H7
NSD	H8
NSD	H9
NSD	H10
NSD	C8-A8
NSD	A9
NSD	A10
NSD	D2
NSD	D3
NSD	D4
NSD	H7
NSD	H8



Grid Op

40

M51855 301 Sample Comments

NE background

MAS TEM ANALYSIS M51855-002

CLIENT NAME: Materials Analytical Services Atlanta CLIENT SAMPLE ID: A-01-B

7402 ANALYSIS

Sample Area/ Volume:	1696.7	Liters	Date Analyzed:	10/4/2010	
Filter Type:	MCE 25mm		Analyst:	A.Keeton	
Pore size:	0.8		Scope Number:	2	
Effective Filter Area:	385		Accelerating Voltage:	100	KV
Sample type:	Air		Indicated Mag:	25	KX
Analysis type:	7402		Screen Mag:	20	KX
Grid Acceptance	YES	3 %	Grid_box:	7707	

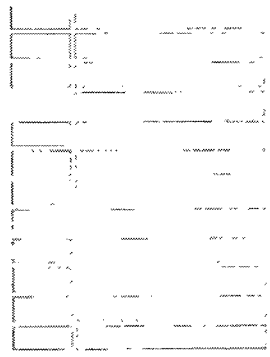
Number of grids:	3	#1:	110	#3:	110	Asbestos	0
Number of openings:	40	#2:	111	#4:	111	Non-asbestos	0

Average Grid Size: 0.012210 Total Area Analyzed: 0.488

% Asbestos 0

Str#	SquareID	Filter Type	Size	Morph	SAED	EDS
NSD	D6-A4					
NSD	A5					
NSD	A6					
NSD	A8					
NSD	A9					
NSD	A10					
NSD	B5					
NSD	B6					
NSD	B7					
NSD	B8					
NSD	B9					
NSD	B10					
NSD	D4					
NSD	D5					
NSD	D6					
NSD	D7					
NSD	D8					
NSD	D9					
NSD	D10					
NSD	F7					
NSD	D7-F10					
NSD	G2					
NSD	G3					
NSD	G4					
NSD	G5					
NSD	H6					
NSD	H7					
NSD	H8					

NSD	H9	
NSD	H10	
NSD	D8-B5	
NSD	B6	
NSD	B7	
NSD	D6	
NSD	D7	
NSD	D8	
NSD	D9	
NSD	D10	
NSD	G1	
NSD	G2	



Grid Op
40

M51855 002 Sample Comments
SE background

MAS TEM ANALYSIS M51855-005

CLIENT NAME:	Materials Analytical Services Atlanta	CLIENT SAMPLE ID:	P-1-A

7402 ANALYSIS

Sample Area/ Volume:	20.1	Liters	Date Analyzed:	9/29/2010	
Filter Type:	MCE 25mm		Analyst:	A.Keeton	
Pore size:	0.8		Scope Number:	2	
Effective Filter Area:	385		Accelerating Voltage:	100	KV
Sample type:	Air		Indicated Mag:	25	KX
Analysis type:	7402		Screen Mag:	20	KX
Grid Acceptance	YES	5 %	Grid_box:	7707	

Number of grids:	3	#1:	110	#3:	110	Asbestos	62
Number of openings:	40	#2:	111	#4:	111	Non-asbestos	2

Average Grid Size: 0.012210 Total Area Analyzed: 0.488

% Asbestos 96.88

S #1	SquareID	Fiber Type	Size		Morph	SAED	ED
1	E6-B5	Crocidolite	8.2	0.45	Amphibole	Amphibole	✓
2	B8	Crocidolite	5 1	0.3	Amphibole	Amphibole	✓
3	B9	Crocidolite	14	0.5	Amphibole	Amphibole	✓
4		Crocidolite	5.5	0.8	Amphibole	Amphibole	✓
5		Anthophylite	5.7	1	Amphibole	Amphibole	✓
6		Anthophylite	9	0.45	Amphibole	Amphibole	✓
NSD	C4						
7	C5	Anthophylite	25 6	1.5	Amphibole	Amphibole	✓
8		Anthophylite	17.7	0.3	Amphibole	Amphibole	✓
9		Crocidolite	6.5	0 4	Amphibole	Amphibole	✓
10		Crocidolite	5.3	0.45	Amphibole	Amphibole	✓
11		Anthophylite	5 5	0.6	Amphibole	Amphibole	
12		Anthophylite	6	0 5	Amphibole	Amphibole	
13	C8	Crocidolite	18	0.3	Amphibole	Amphibole	
14	C9	Anthophylite	11.7	0.6	Amphibole	Amphibole	
15		Anthophylite	5 8	0.8	Amphibole	Amphibole	
16		Anthophylite	6 8	1	Amphibole	Amphibole	
17		Crocidolite	5.5	0.4	Amphibole	Amphibole	
18		Crocidolite	10.5	0.4	Amphibole	Amphibole	
19		Anthophylite	18 7	0 6	Amphibole	Amphibole	
20	C10	Anthophylite	5 9	0.6	Amphibole	Amphibole	✓
21	D8	Crocidolite	13 5	0 45	Amphibole	Amphibole	
22		Crocidolite	24.3	1 6	Amphibole	Amphibole	
23		Anthophylite	10.8	1.8	Amphibole	Amphibole	
24		Anthophylite	9	1.5	Amphibole	Amphibole	
25		Crocidolite	22 5	1 1	Amphibole	Amphibole	
NSD	D9						
26	D10	NA	6 9	0 45	Ambiguous	Ambiguous	

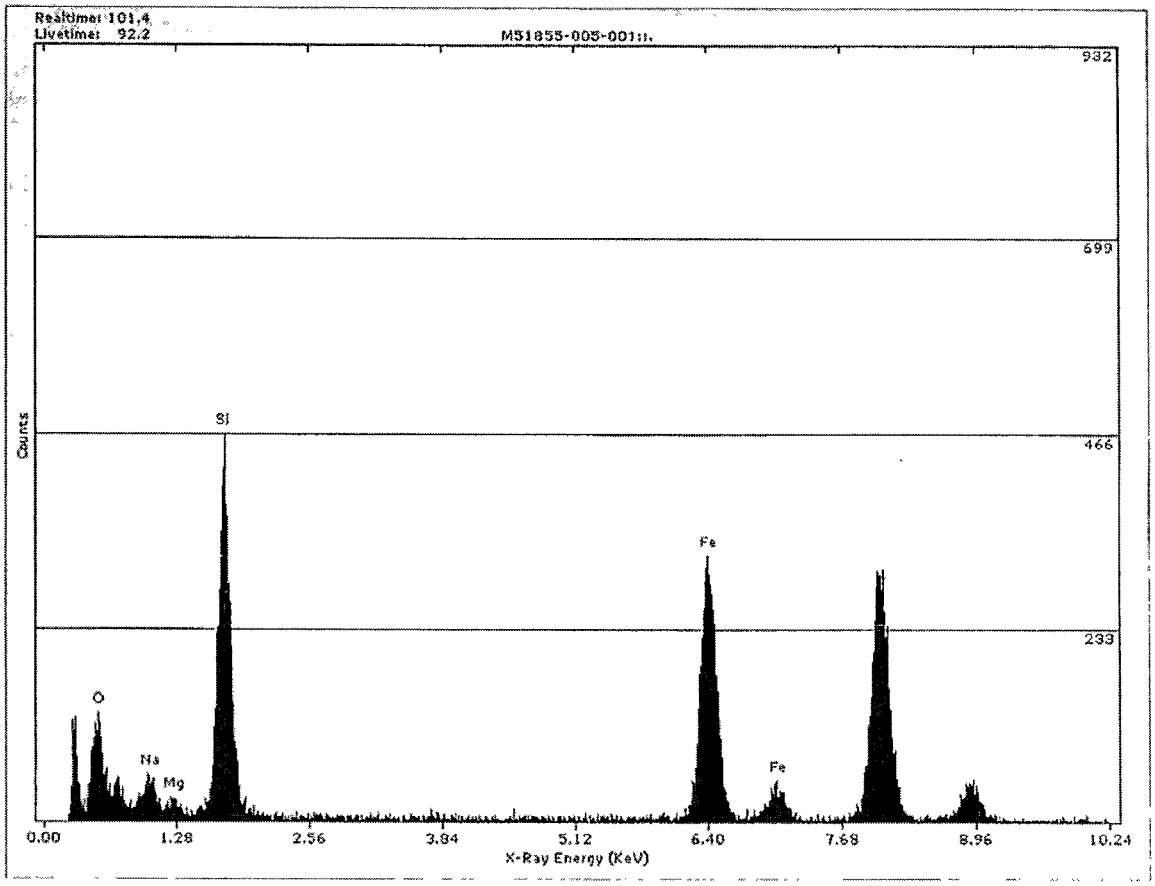
27			Anthophylite	5.7	0.6	Amphibole	Amphibole	
28			Anthophylite	6.7	0.3	Amphibole	Amphibole	
29	E7		Anthophylite	5.2	0.45	Amphibole	Amphibole	
30			Crocidolite	20.7	0.5	Amphibole	Amphibole	✓
31	E8		Anthophylite	6.5	1	Amphibole	Amphibole	
32			Anthophylite	15.7	1.5	Amphibole	Amphibole	
33			Anthophylite	11.2	0.8	Amphibole	Amphibole	
34			Anthophylite	8.8	0.6	Amphibole	Amphibole	
35			Anthophylite	13	0.5	Amphibole	Amphibole	
36			Anthophylite	5.9	0.4	Amphibole	Amphibole	
37			Crocidolite	9.6	0.3	Amphibole	Amphibole	
38			Crocidolite	32.4	0.3	Amphibole	Amphibole	
39			Crocidolite	5.3	0.45	Amphibole	Amphibole	
40	E9		Crocidolite	9.6	0.45	Amphibole	Amphibole	✓
41			Crocidolite	5.2	0.8	Amphibole	Amphibole	
NSD	E10							
42	E7-B2		Anthophylite	9	0.5	Amphibole	Amphibole	
43			Anthophylite	14.7	0.5	Amphibole	Amphibole	
NSD	B3							
44	B4		Anthophylite	9.8	1	Amphibole	Amphibole	
45			Crocidolite	6.5	1	Amphibole	Amphibole	
46	B5		Crocidolite	14.7	0 45	Amphibole	Amphibole	
47			Crocidolite	6.3	0.3	Amphibole	Amphibole	
48	B8		Crocidolite	9.5	0.3	Amphibole	Amphibole	
49	B9		Anthophylite	5.9	0.6	Amphibole	Amphibole	
50			Anthophylite	16.7	1	Amphibole	Amphibole	✓
51			Anthophylite	5.3	0.3	Amphibole	Amphibole	
52	B10		Crocidolite	7.1	0.3	Amphibole	Amphibole	
NSD	D2							
NSD	D3							
53	D4		Crocidolite	8	1	Amphibole	Amphibole	
NSD	E1							
NSD	E2							
NSD	E3							
NSD	E4							
54	G3		Crocidolite	9.8	1	Amphibole	Amphibole	
NSD	G4							
55	G5		Anthophylite	13.1	1	Amphibole	Amphibole	
56			Crocidolite	6.9	0.3	Amphibole	Amphibole	
NSD	G6							
NSD	G7							
57	G8		Anthophylite	9	0.3	Amphibole	Amphibole	
58			Anthophylite	40 5	1	Amphibole	Amphibole	
59	E8-B7		Anthophylite	10 3	1	Amphibole	Amphibole	
60			Crocidolite	6.5	0.5	Amphibole	Amphibole	✓
61			Anthophylite	28.1	0.45	Amphibole	Amphibole	
62		NA		13	0 4	Ambiguous	Ambiguous	
NSD	B8							
NSD	C2							
63	G3		Anthophylite	11 2	0.5	Amphibole	Amphibole	
64			Crocidolite	18	0.6	Amphibole	Amphibole	
65			Anthophylite	9	0.4	Amphibole	Amphibole	
NSD	G8							

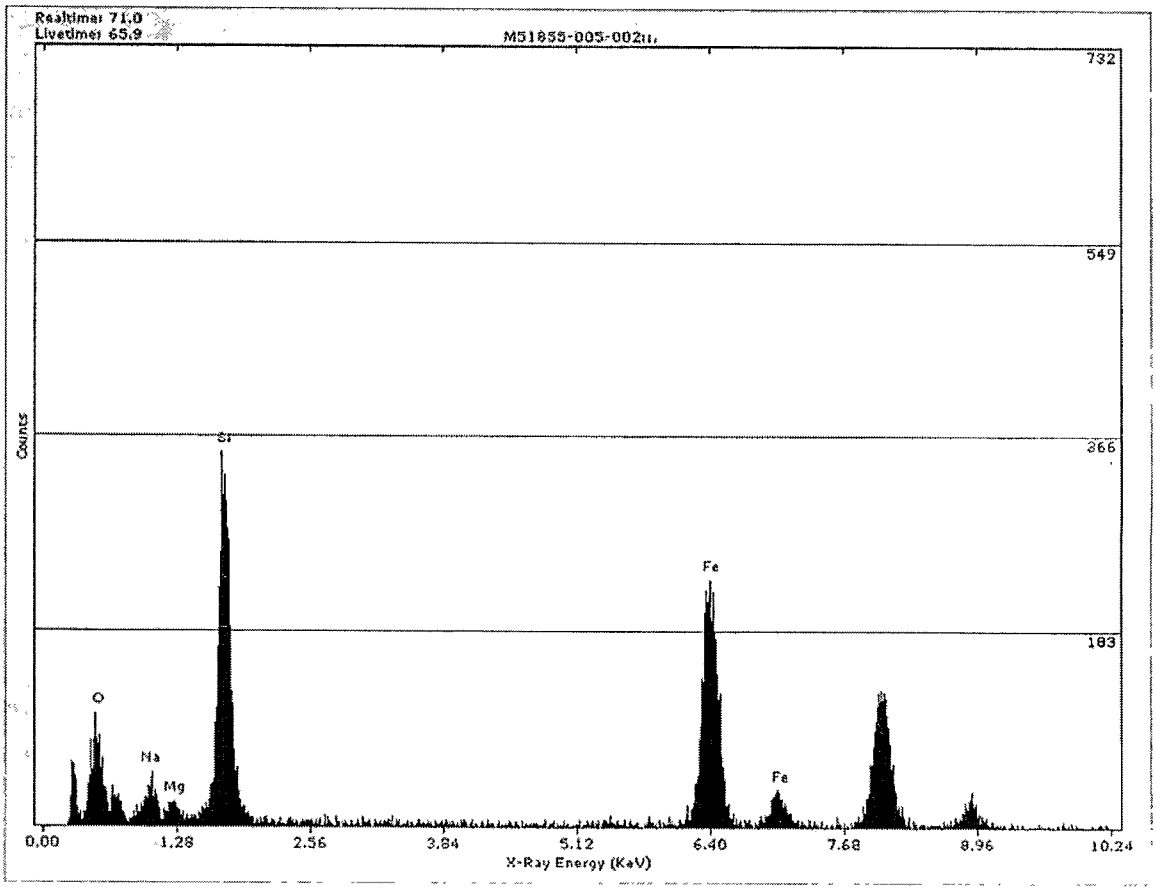
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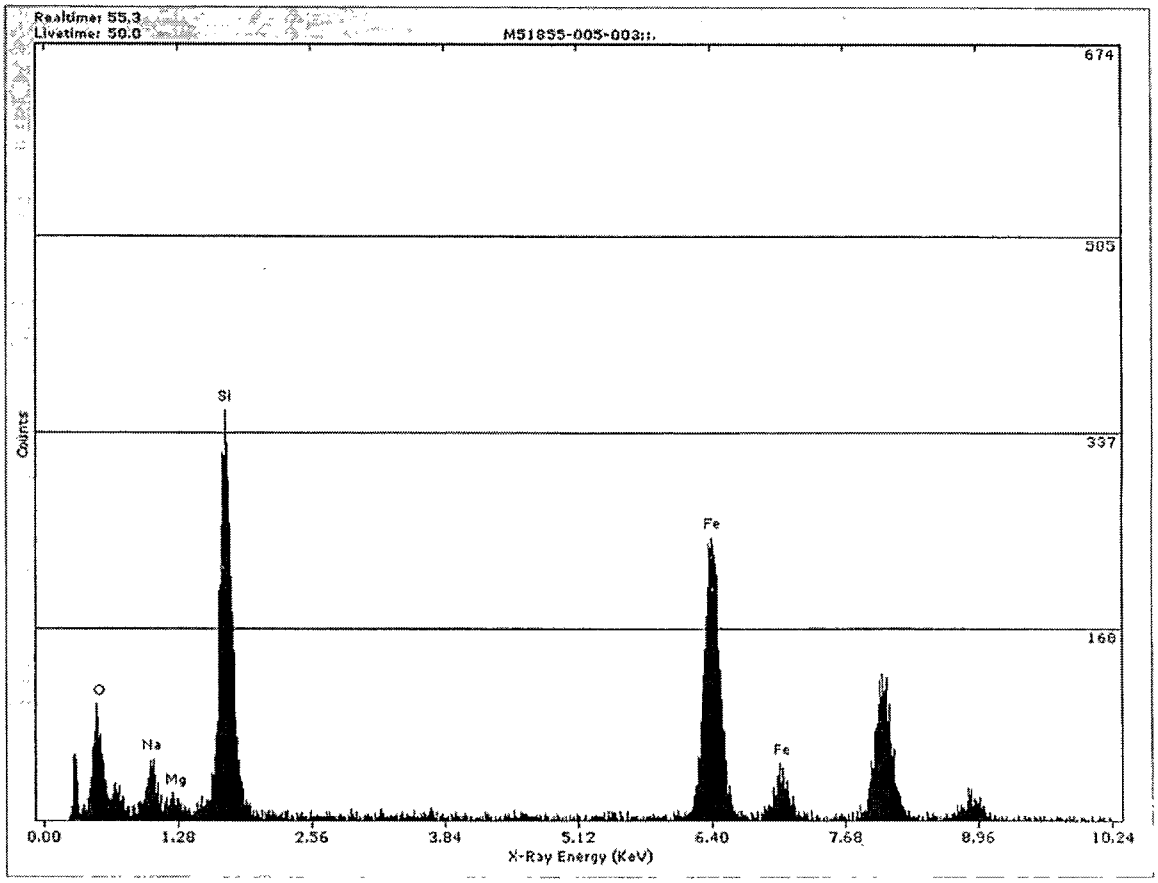
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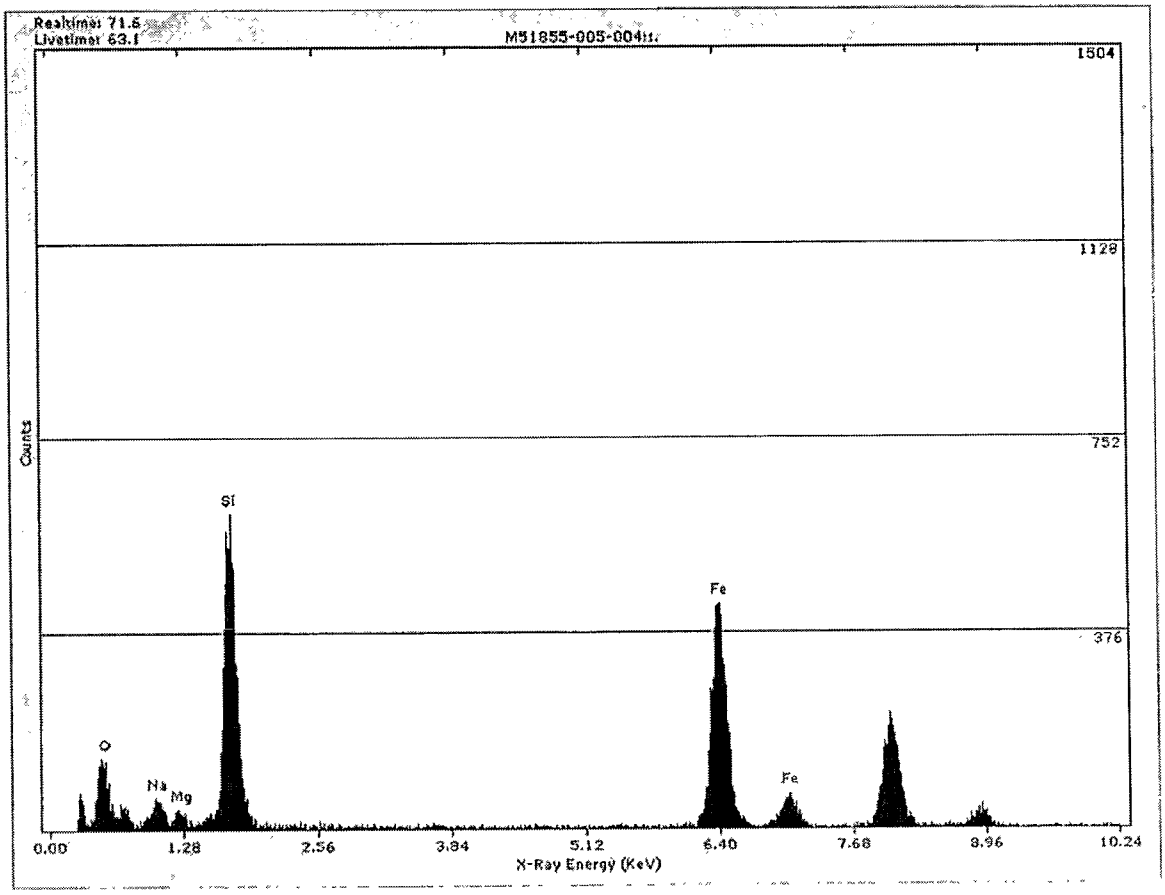
M51855 005 Sample Comments:

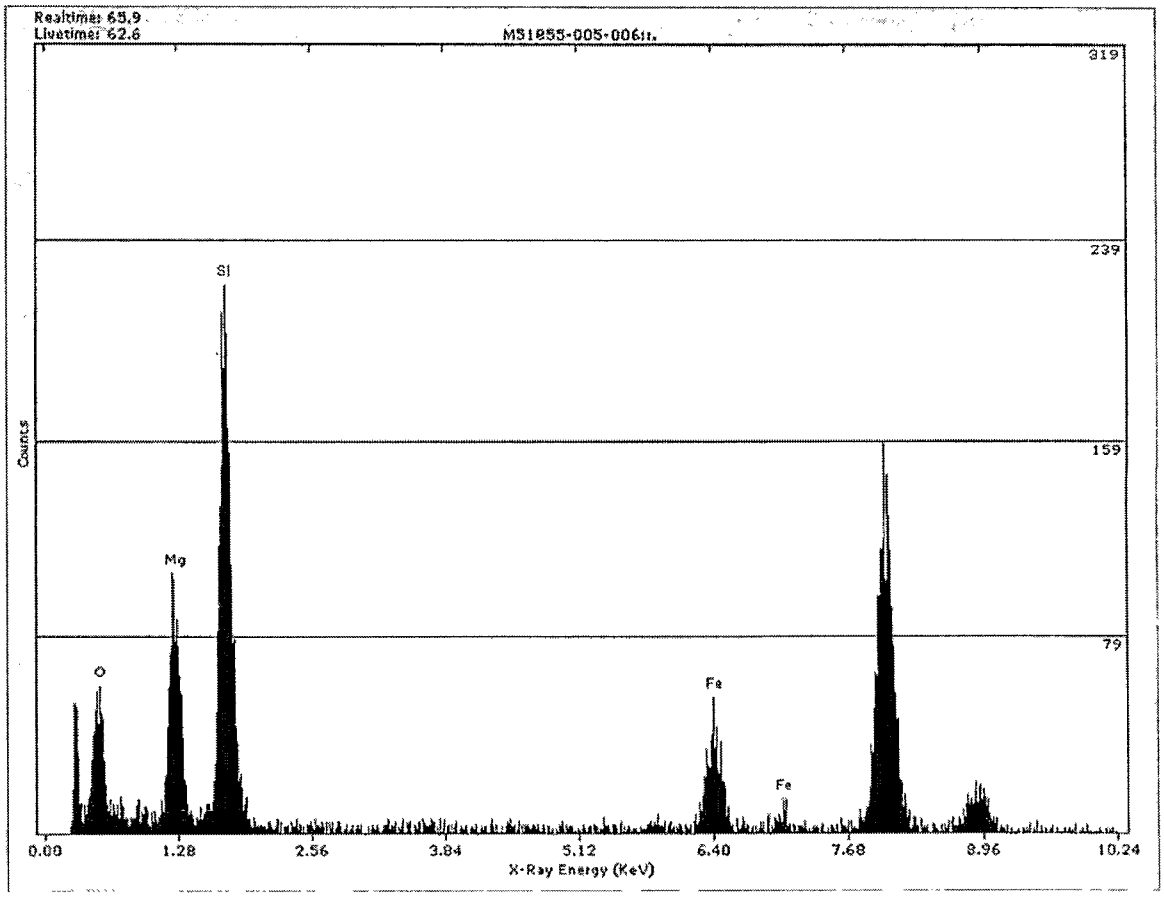
personal right

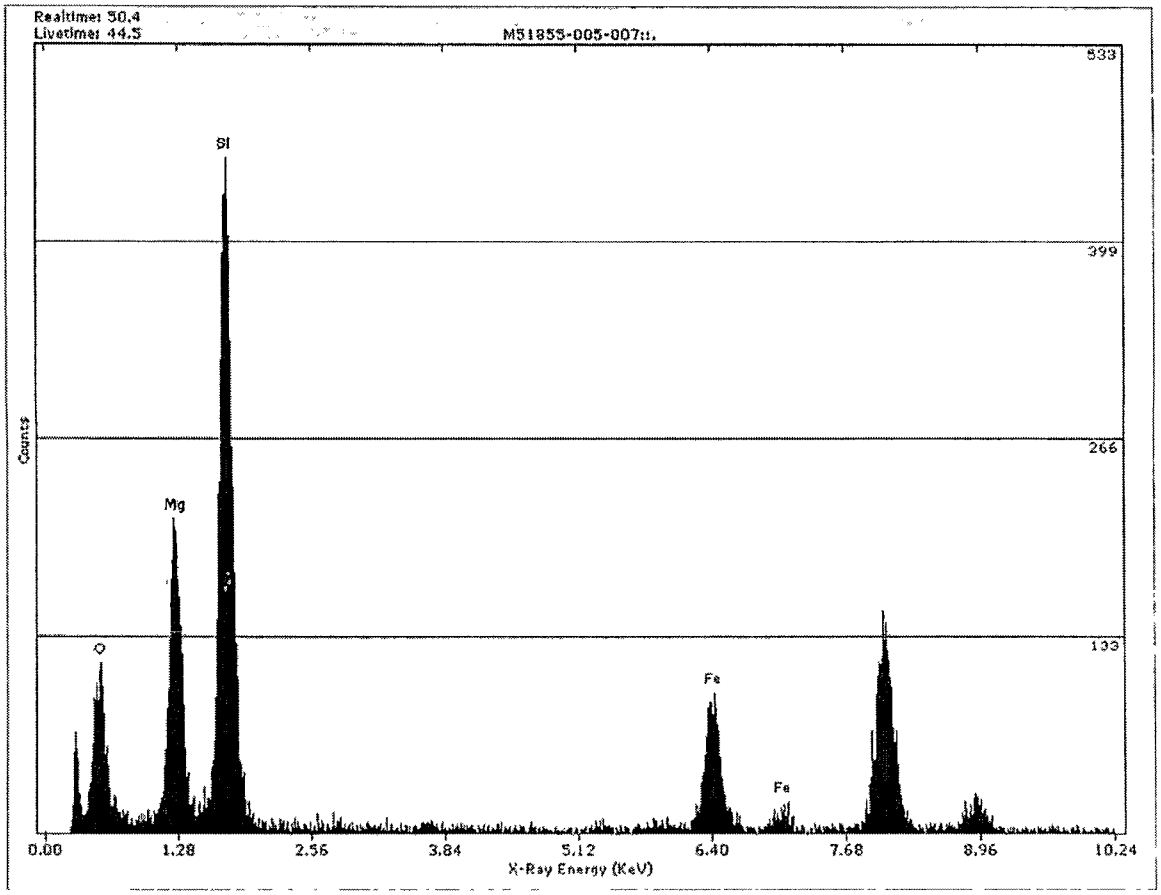

Realtime: 101.4
Livetime: 92.2
M51855-005-001.
932
699
466
233
Counts
Si
Fe
Fe
O
Na
Mg
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)

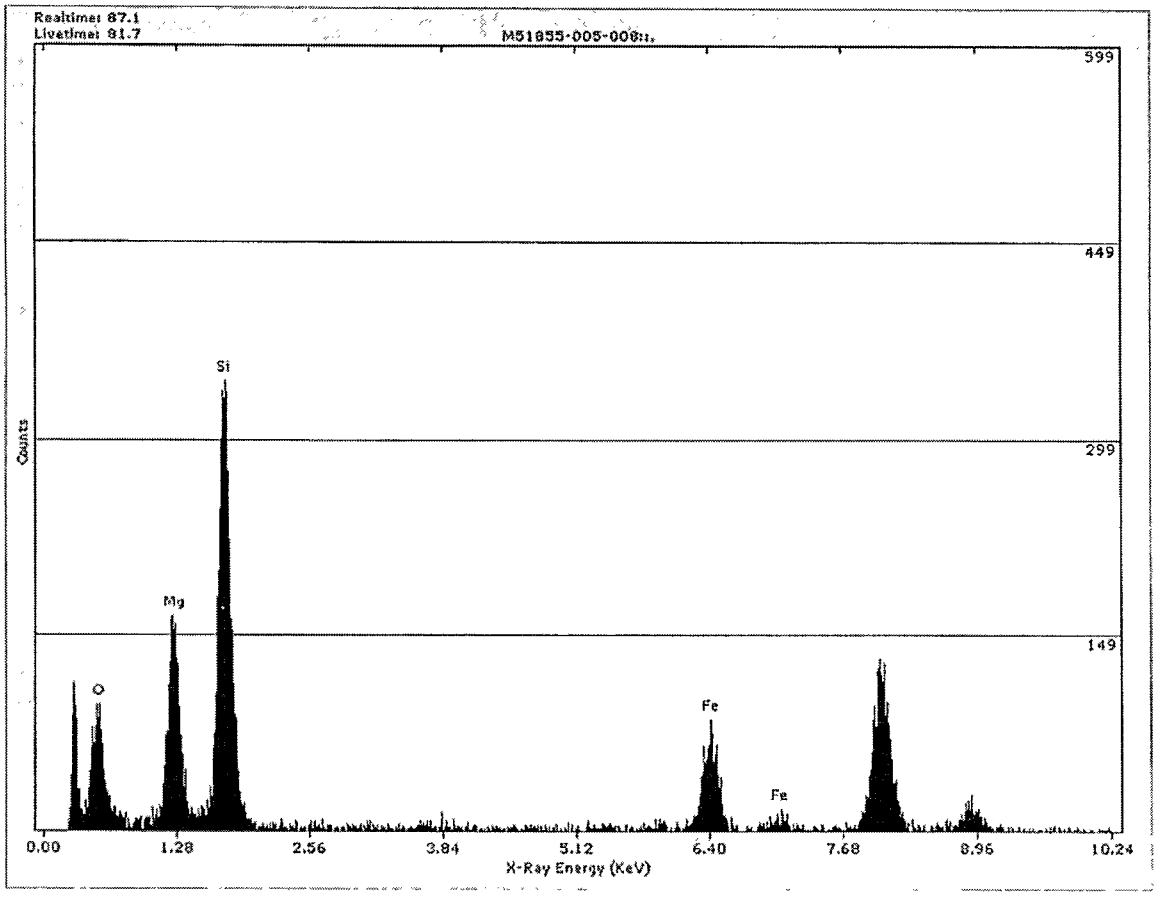

Realtime: 71.0
Livetime: 65.9
M51855-005-002II
732
549
366
183
Counts
Si
Fe
O
Na
Mg
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)

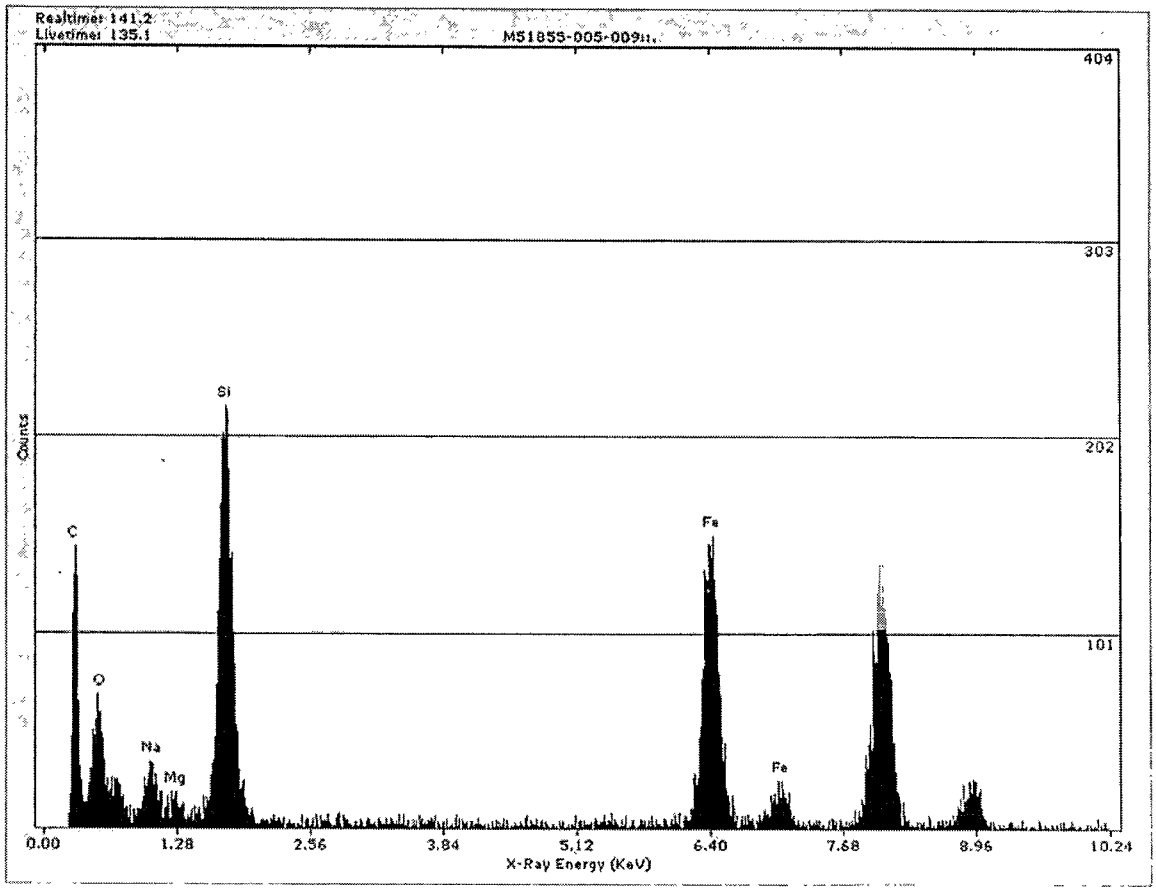

Realtime: 55.3
Livetime: 50.0
M51855-005-003::.
674
505
337
168
Counts
O
Na
Mg
Si
Fe
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)

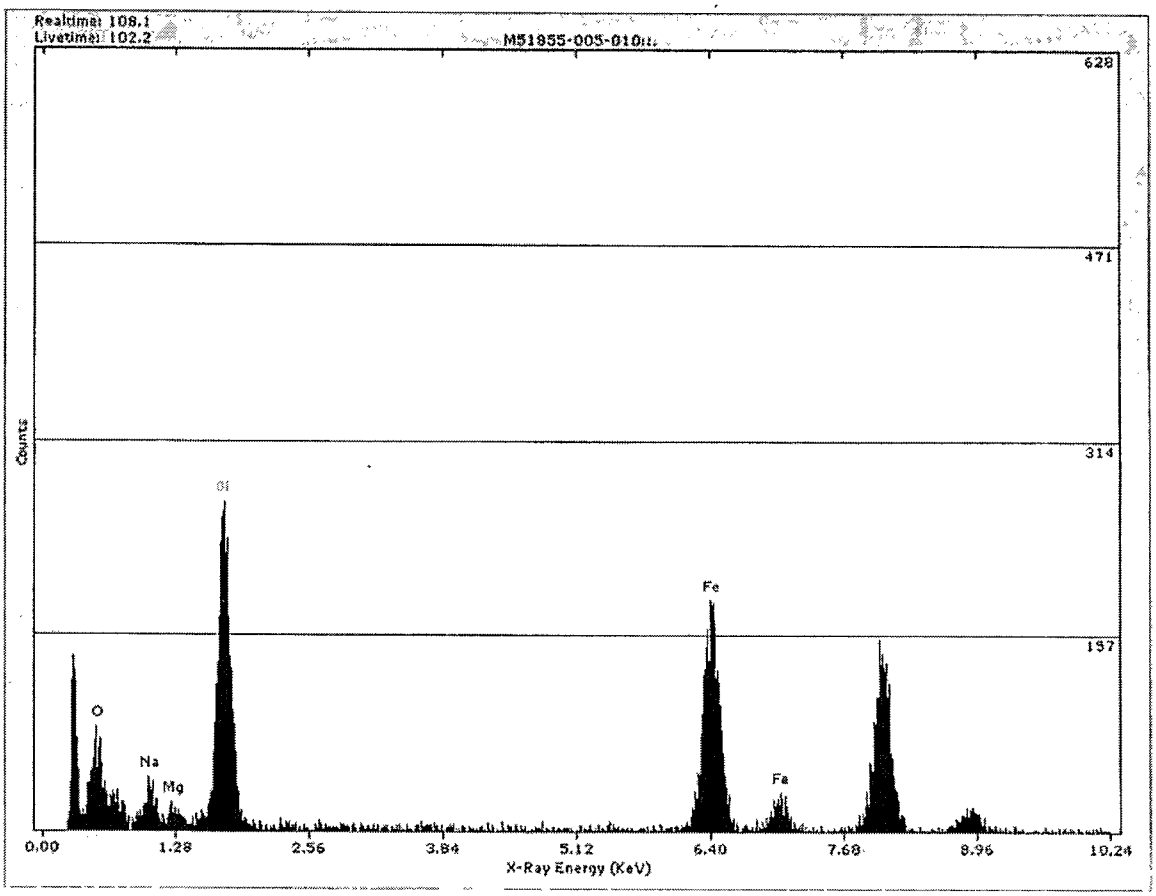

Realtime: 71.6
Livetime: 63.1
M51855-005-004
1504
1128
752
376
Counts
Si
Fe
Fe
O
Na
Mg
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)

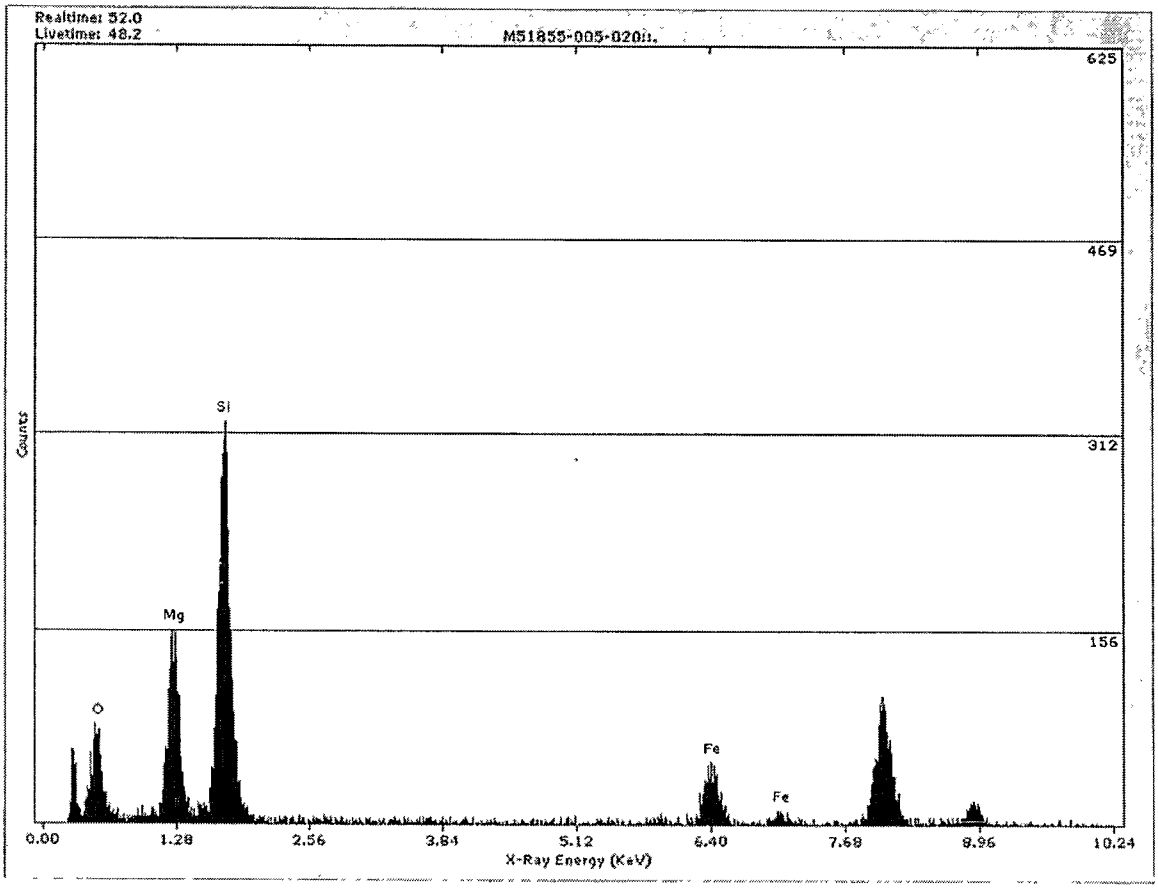

Realtime: 65.9
Livetime: 62.6
MS1855-005-006.rt.
319
239
159
79
Counts
Si
Mg
O
Fe
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)

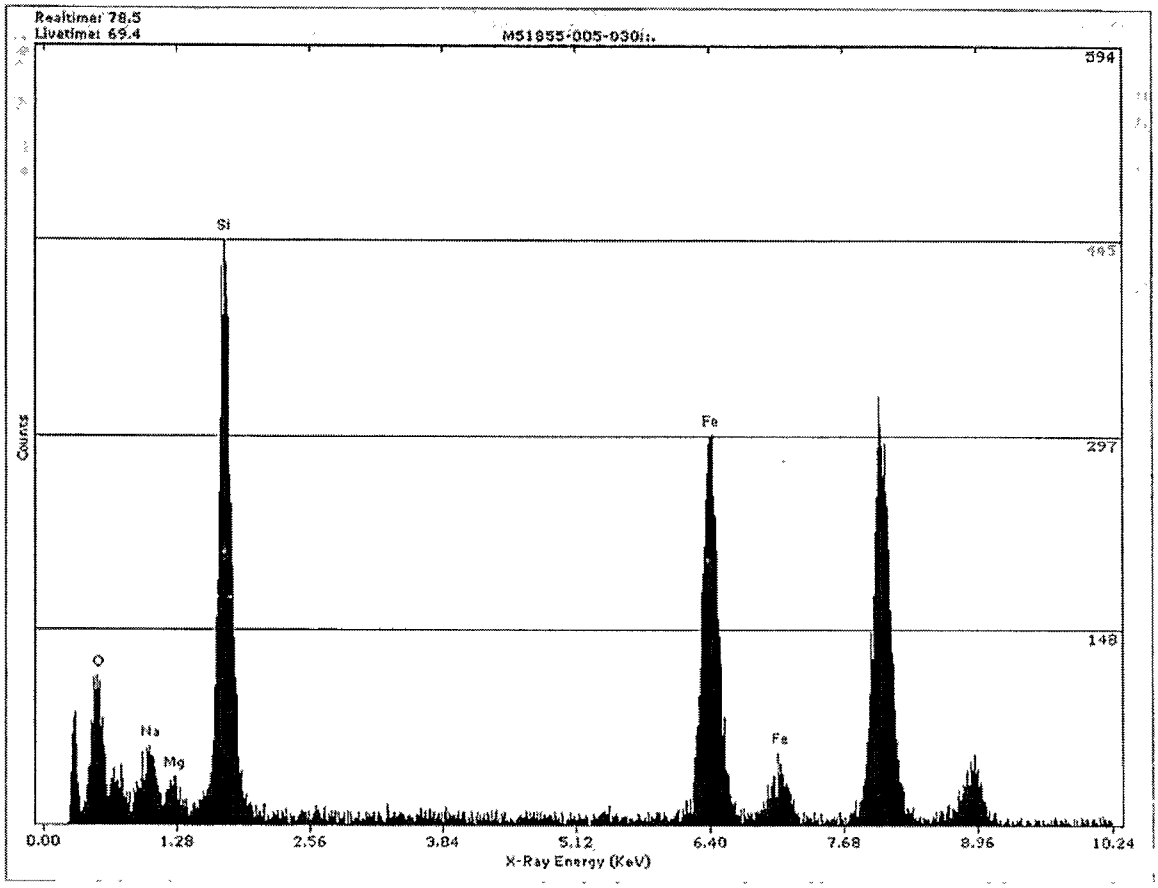

Realtime: 30.4
Livetime: 44.5
M51855-005-007::.
533
399
266
133
Counts
Si
Mg
O
Fe
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)

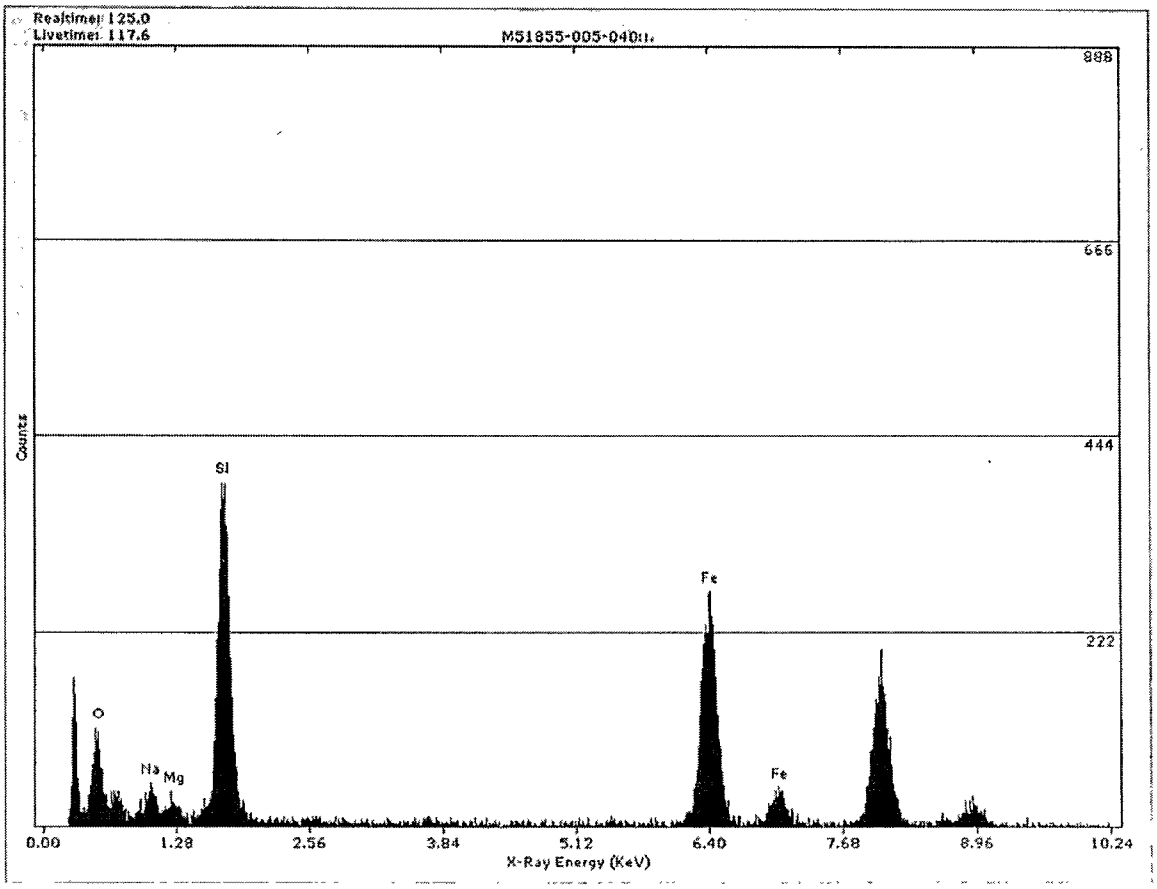

Realtime: 87.1
Livetime: 81.7
599
449
299
149
Counts
Si
Mg
O
Fe
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)

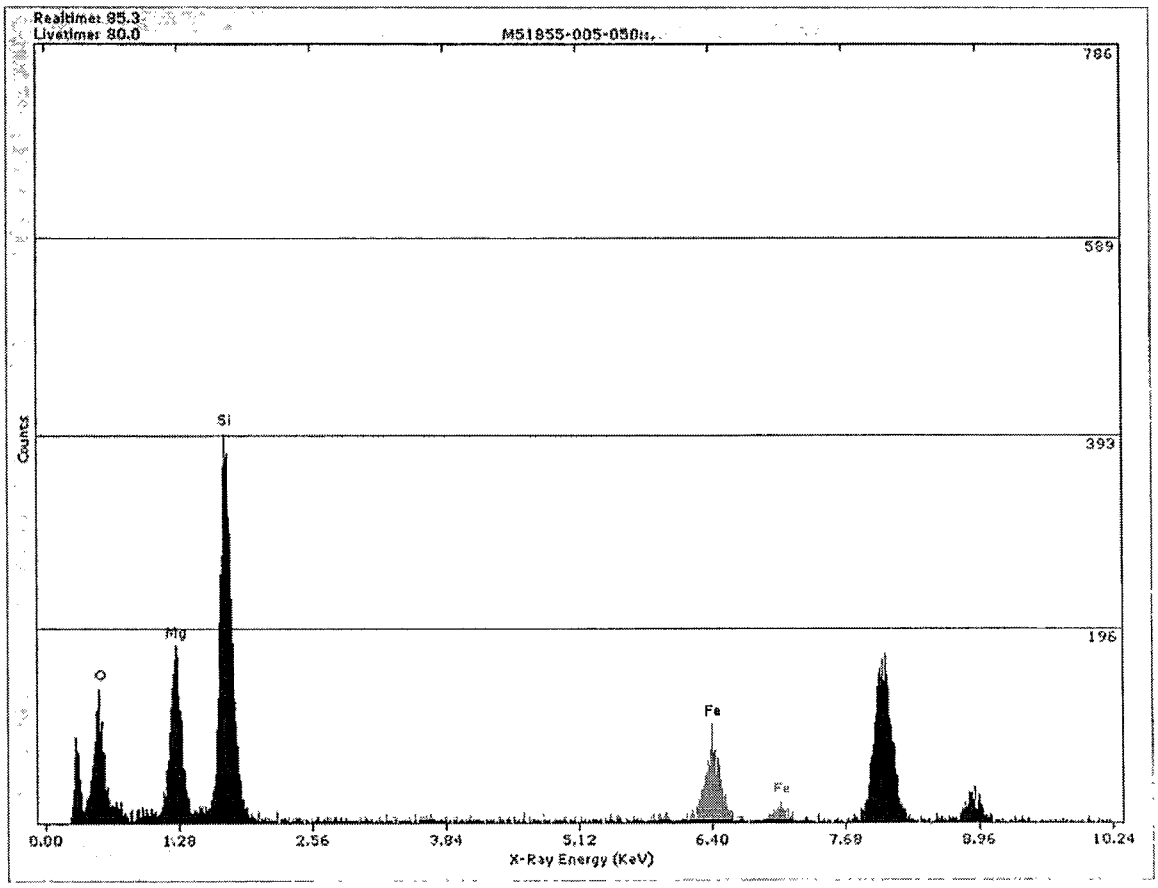

Realtime: 141.2
Livetime: 135.1
M51855-005-009
404
303
202
101
Counts
Si
C
O
Na
Mg
Fe
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)

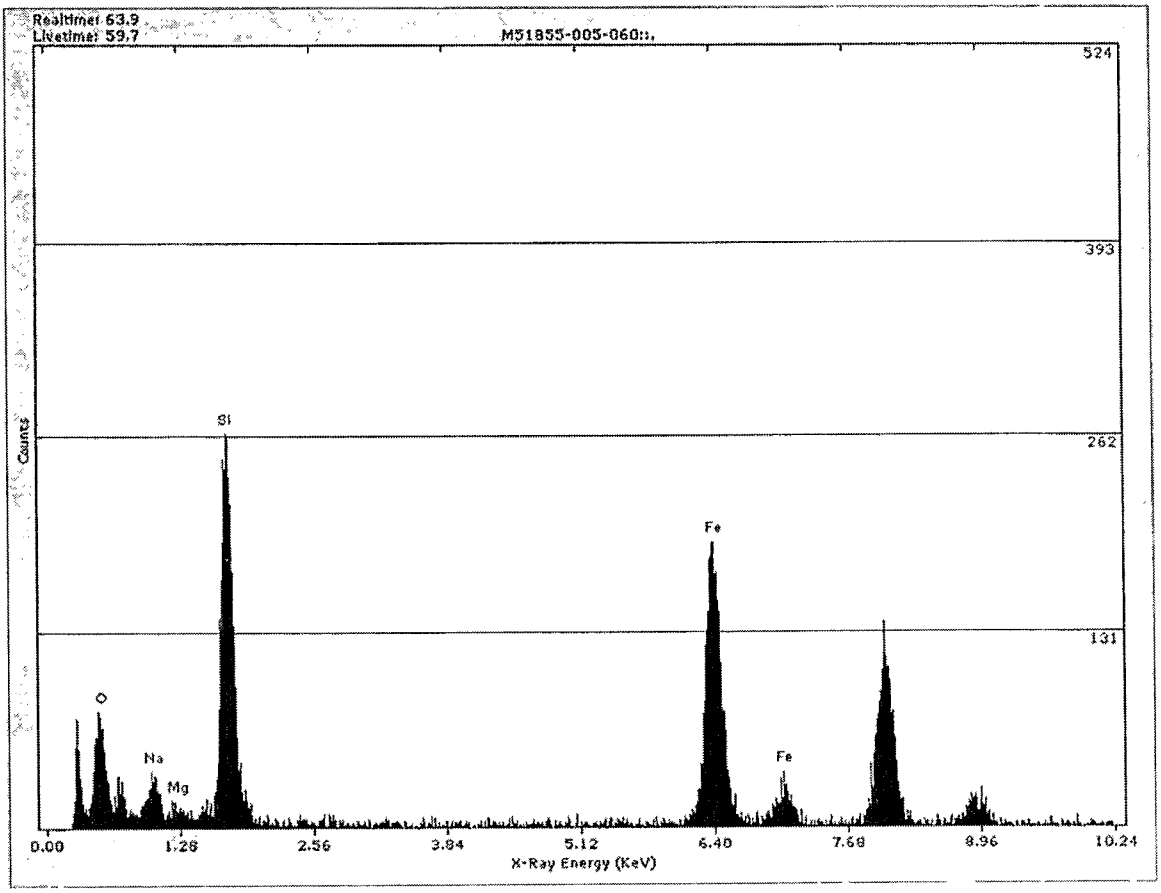

Realdime: 108.1
Livetime: 102.2
M51855-005-010.
628
471
314
157
Counts
Si
Fe
O
Na
Mg
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)


Realtime: 52.0
Livetime: 48.2
M51855-005-020ii.
625
469
312
156
Counts
Si
Mg
O
Fe
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)


Realtime: 78.5
Livetime: 69.4
MS1855-005-030i..
594
495
297
148
Counts
Si
Fe
O
Na
Mg
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)


Realtime: 125.0
Livetime: 117.6
M51855-005-040.1.
888
666
444
222
Counts
Si
Fe
Fe
O
Na
Mg
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)


Realtime: 95.3
Livetime: 80.0
M51855-005-050n..
786
589
393
196
Counts
O
Mg
Si
Fe
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.69
8.96
10.24
X-Ray Energy (KeV)


Realtime: 63.9
Livetime: 59.7
M51855-005-060::,
524
393
262
131
Counts
Si
Fe
Fe
O
Na
Mg
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)

MAS TEM ANALYSIS M51855-006

CLIENT NAME: Materials Analytical Services Atlanta CLIENT SAMPLE ID: P-1-B

7402 ANALYSIS

Sample Area/ Volume:	21	Liters	Date Analyzed:	10/4/2010	
Filter Type:	MCE 25mm		Analyst:	A Keeton	
Pore size:	0 8		Scope Number:	2	
Effective Filter Area:	385		Accelerating Voltage:	100	KV
Sample type:	Air		Indicated Mag:	25	KX
Analysis type:	7402		Screen Mag:	20	KX
Grid Acceptance	YES	3 %	Grid_box:	7707	

Number of grids:	3	#1:	110	#3:	110
Number of openings:	40	#2:	111	#4:	111

Asbestos 22
Non-asbestos 2

Average Grid Size: 0.012210 Total Area Analyzed: 0.488

% Asbestos 91.67

Str#	SquareID	Fiber Type	Size		Morph	SAED	EDS
NSD	D9-B2						
1	B3	Crocidolite	18.1	0.9	Amphibole	Amphibole	✓
NSD	B4						
NSD	B5						
NSD	B6						
NSD	B7						
NSD	B8						
NSD	C1						
2	C2	Anthophylite	9	0.6	Amphibole	Amphibole	✓
NSD	C3						
NSD	C4						
NSD	C5						
3	C6	Anthophylite	9	0 45	Amphibole	Amphibole	✓
4	C7	Anthophylite	7.3	0 45	Amphibole	Amphibole	✓
NSD	C8						
5	C9	Anthophylite	11.5	1	Amphibole	Amphibole	✓
6		Anthophylite	14 3	2	Amphibole	Amphibole	✓
7		Anthophylite	13.5	1.5	Amphibole	Amphibole	✓
8		Anthophylite	10 5	1	Amphibole	Amphibole	✓
9			9	0 5	Ambiguous	Ambiguous	✓
NSD	C10						
NSD	G6						
NSD	G7						
NSD	G8						
10	D10-B2	Anthophylite	9 5	0.5	Amphibole	Amphibole	✓
11		Anthophylite	13	0 6	Amphibole	Amphibole	
12		Anthophylite	6 3	0.4	Amphibole	Amphibole	
13		Anthophylite	13 5	0 6	Amphibole	Amphibole	

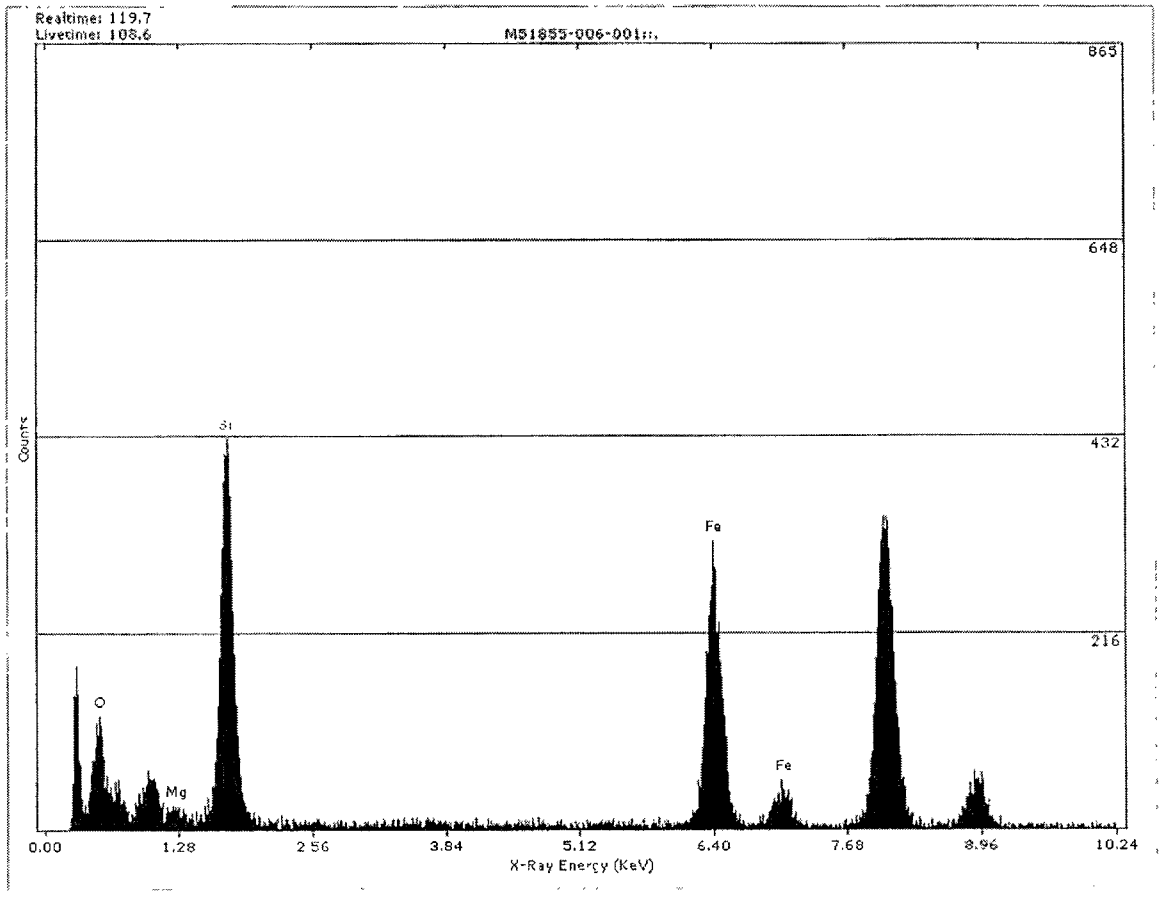
NSD	B3						
14	B4		Anthophylite	22 6	0.6	Amphibole	Amphibole
NSD	B5						
NSD	B6						
15	B7		Anthophylite	22.5	1	Amphibole	Amphibole
16	B8	NA		15.6	0.4	Ambiguous	None
17	B9		Anthophylite	18	1	Amphibole	Amphibole
NSD	D3						
NSD	F4						
NSD	E9-B1						
NSD	B2						
18	B3		Anthophylite	10.2	2	Amphibole	Amphibole
19			Anthophylite	13.8	0.4	Amphibole	Amphibole
20			Crocidolite	5.2	0.45	Amphibole	Amphibole
21	B4		Anthophylite	15.9	1.1	Amphibole	Amphibole
22			Anthophylite	7.2	0.45	Amphibole	Amphibole
NSD	B5						
NSD	B6						
NSD	G2						
23	G3		Anthophylite	13.5	0.45	Amphibole	Amphibole
24	G4		Crocidolite	11 3	0.5	Amphibole	Amphibole
NSD	G6						

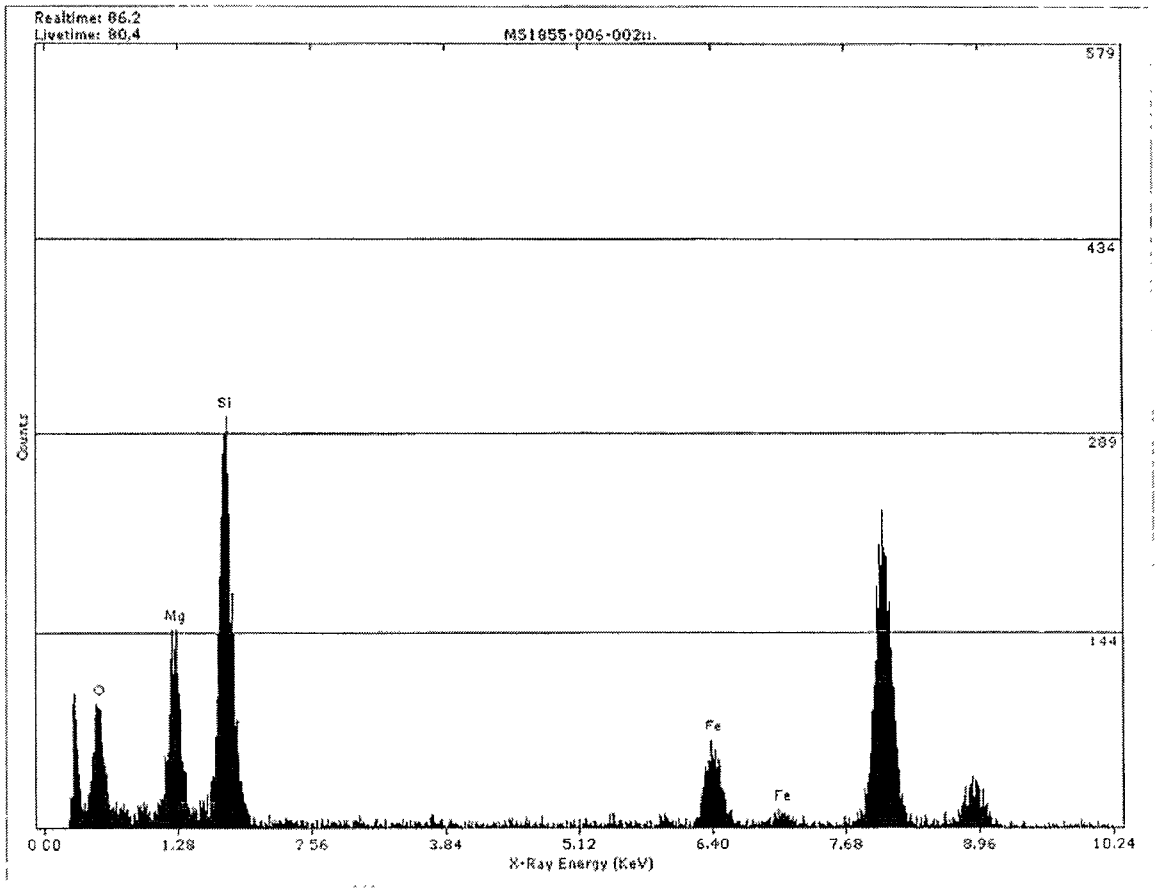
Grid Op

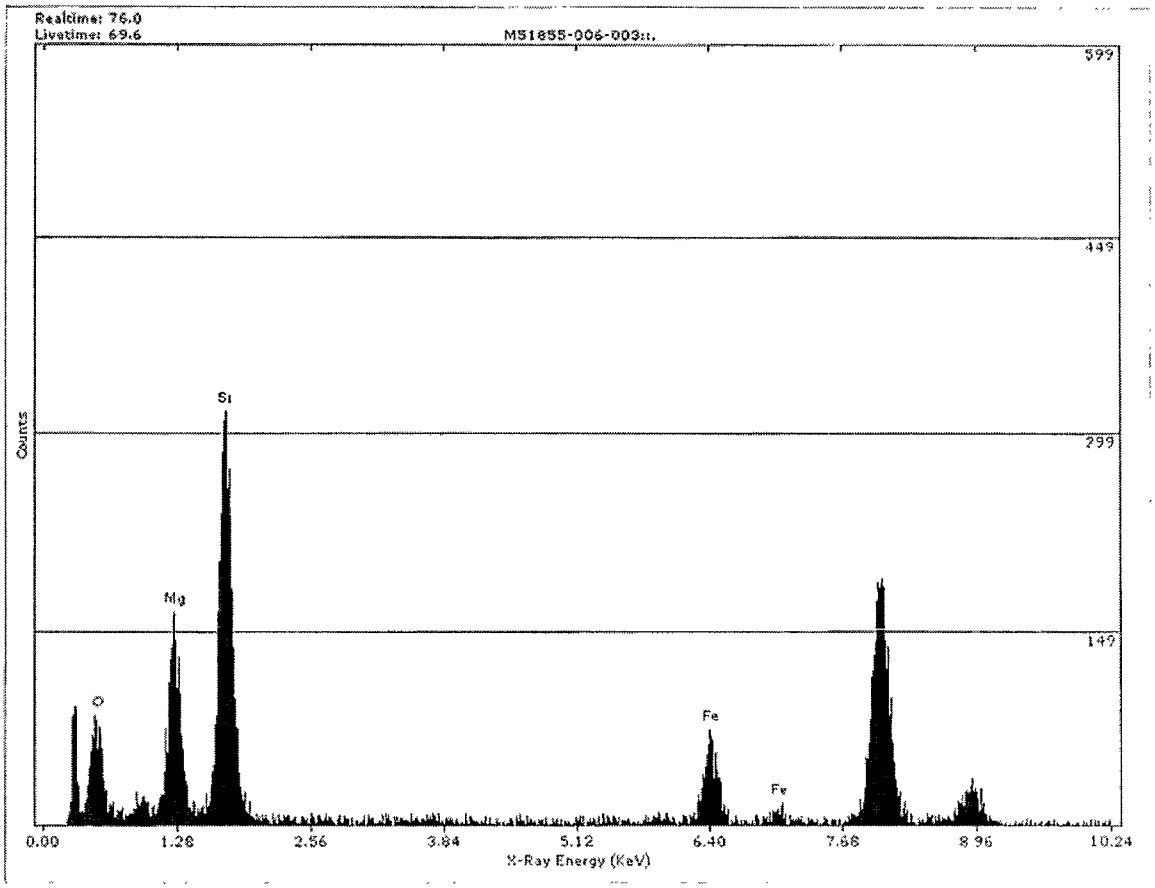
40

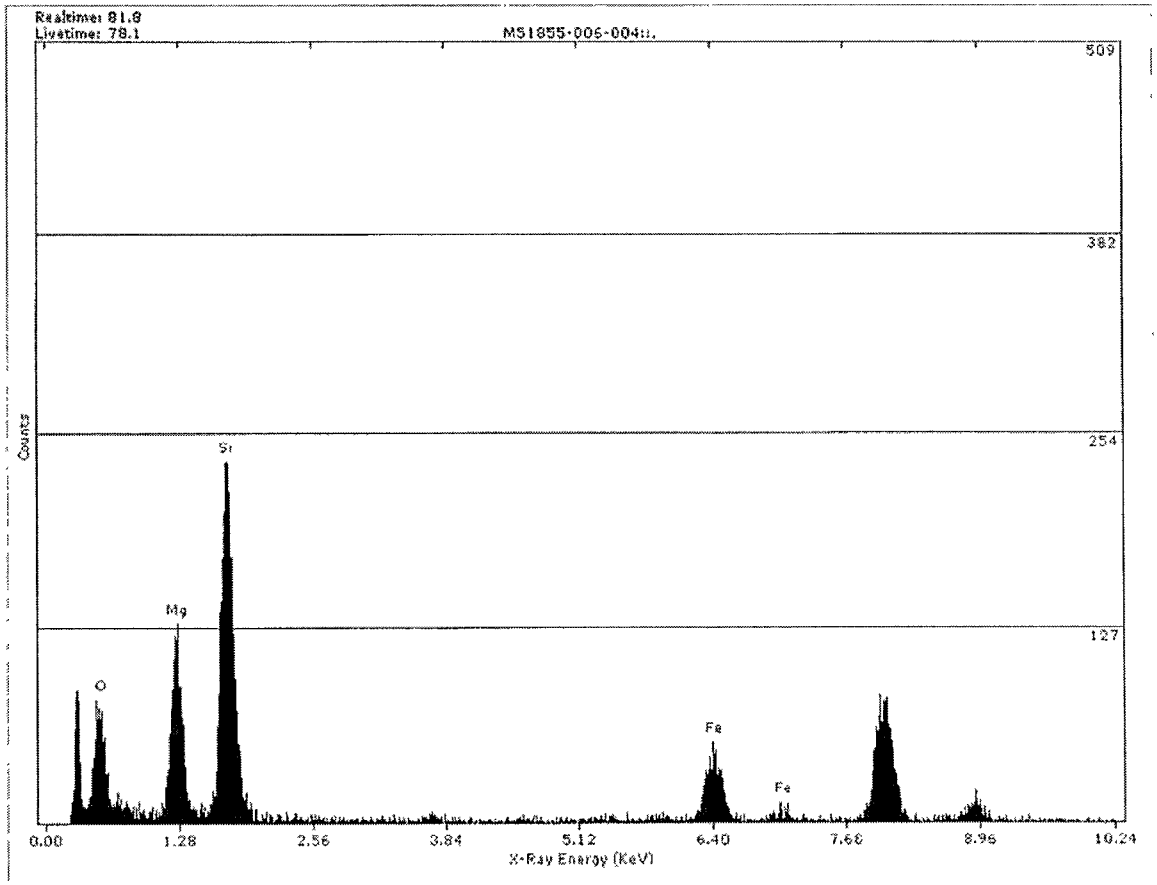
M51855 006 Sample Comments:

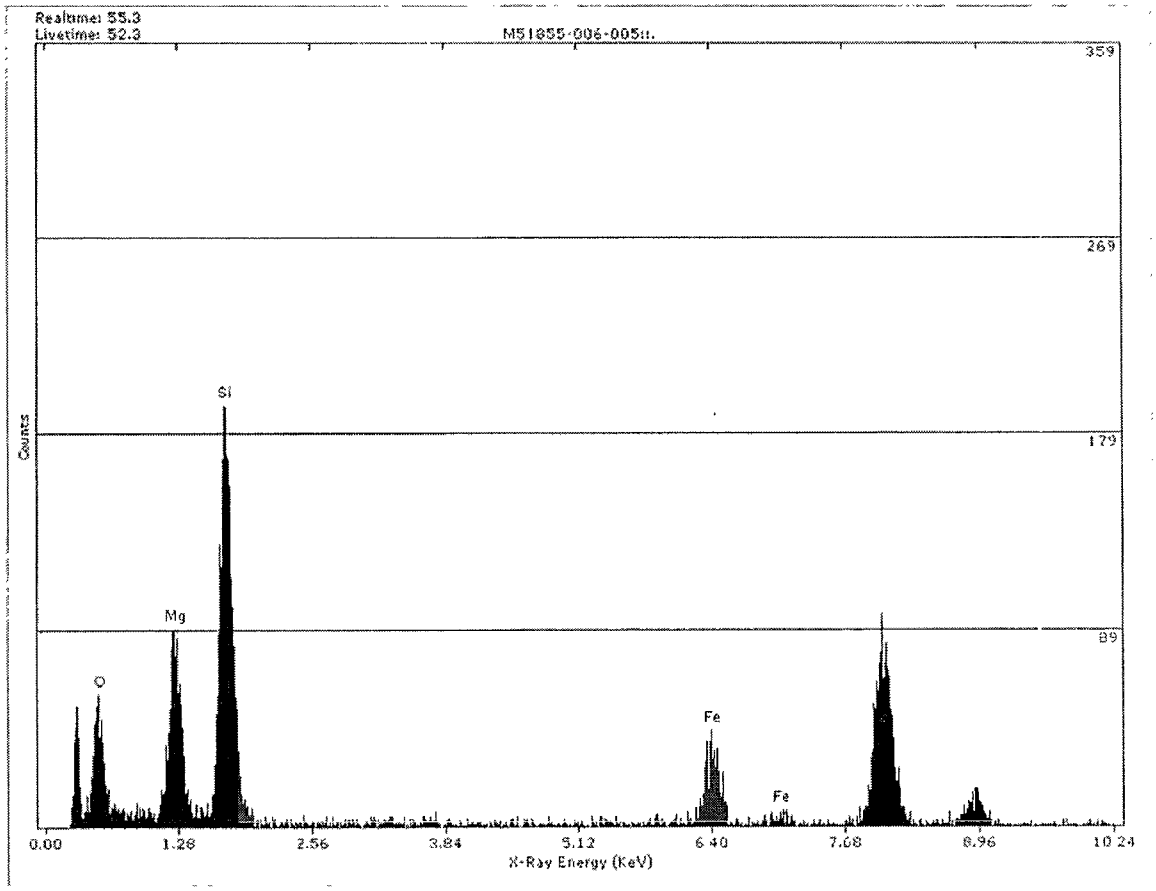
personal left

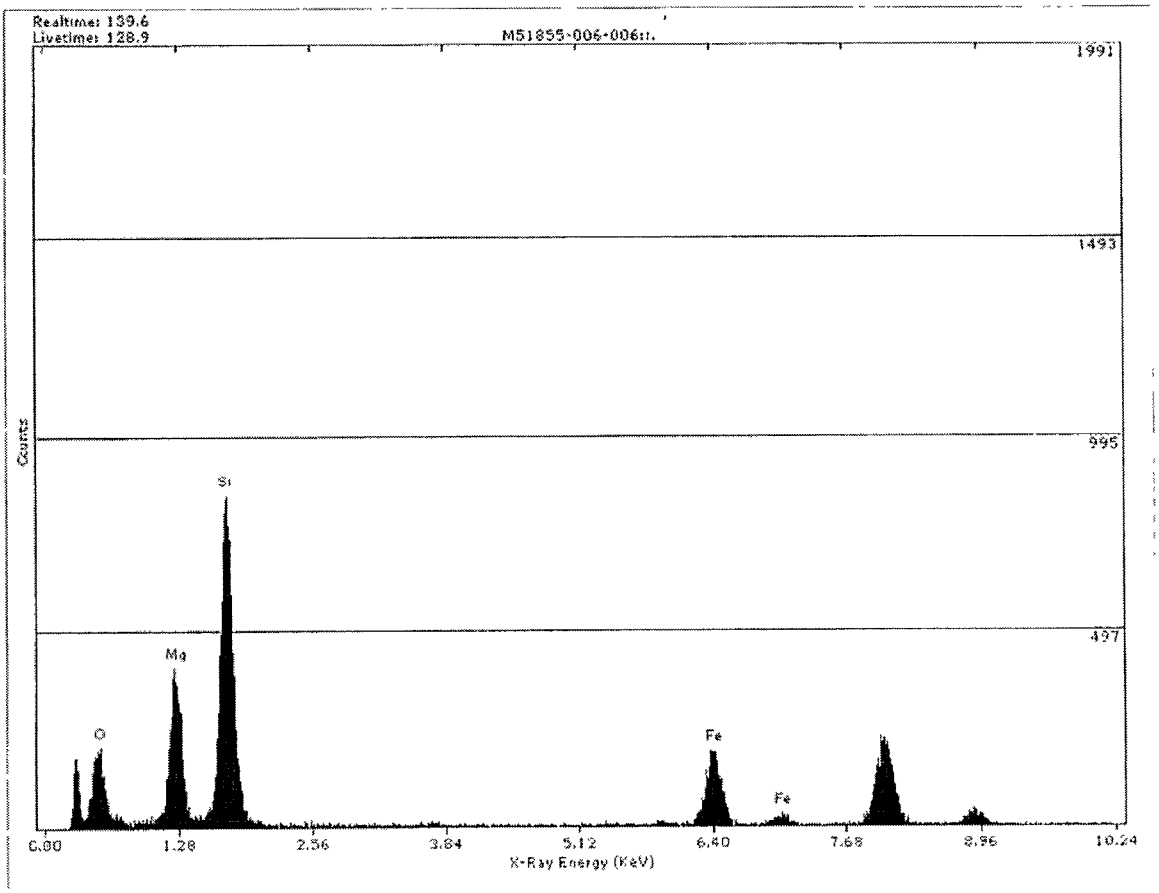

Realtime: 119.7
Livetime: 108.6
M51855-006-001
865
648
432
216
Counts
Si
O
Mg
Fe
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)

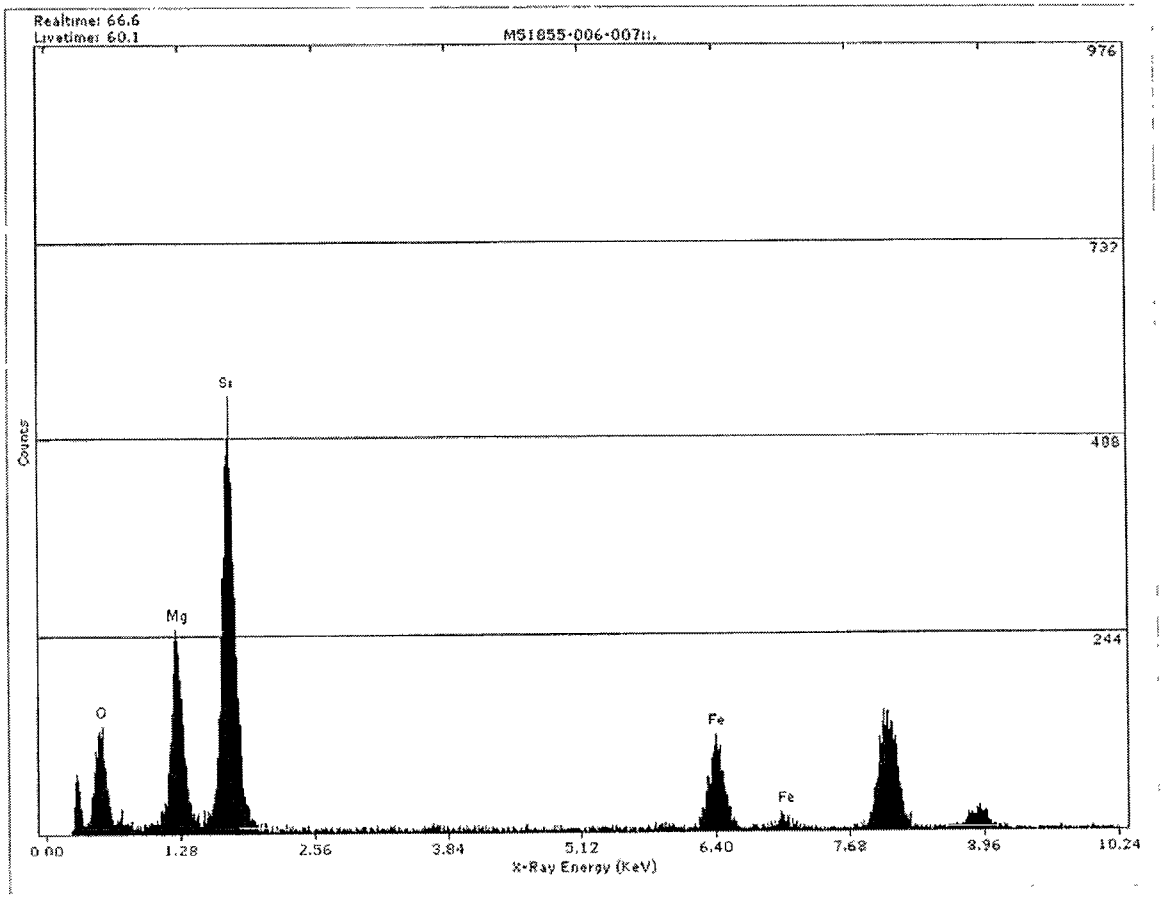

Realtime: 86.2
Livetime: 80.4
MS1655-006-002n.
579
434
289
144
Counts
Si
Mg
O
Fe
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)

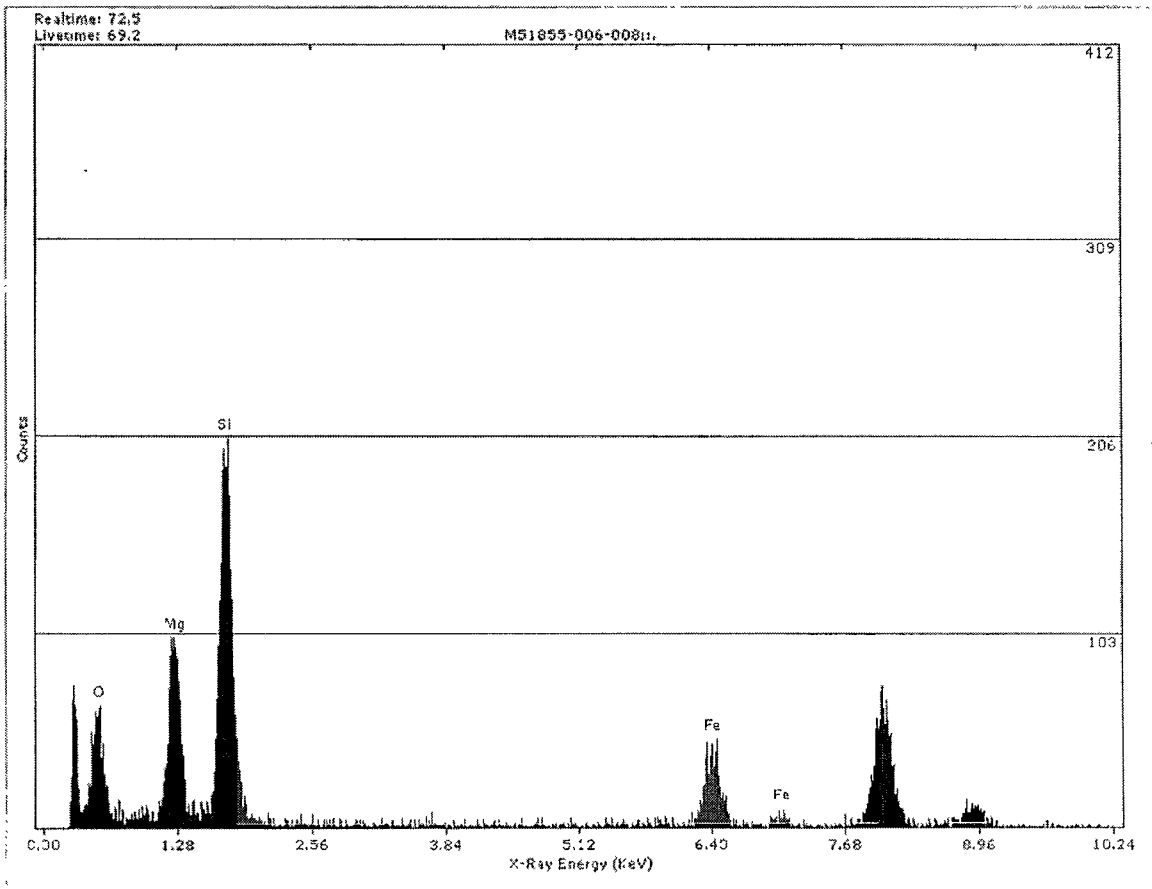

Realtime: 76.0
Livetime: 69.6
M51855-006-003.rt.
599
449
299
149
Counts
Si
Mg
O
Fe
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)

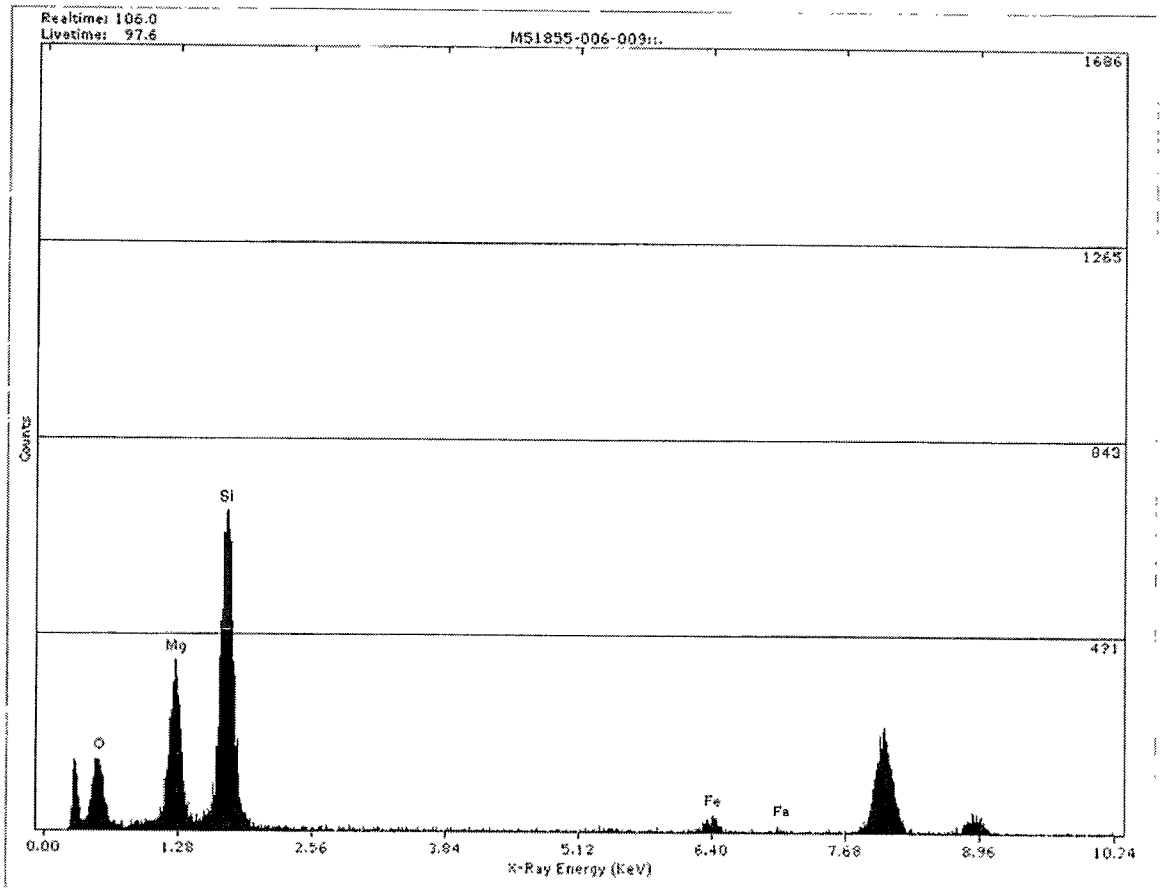

Realtime: 81.8
Livetime: 78.1
MS1855-006-004::.
509
382
254
127
Counts
Si
Mg
O
Fe
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)

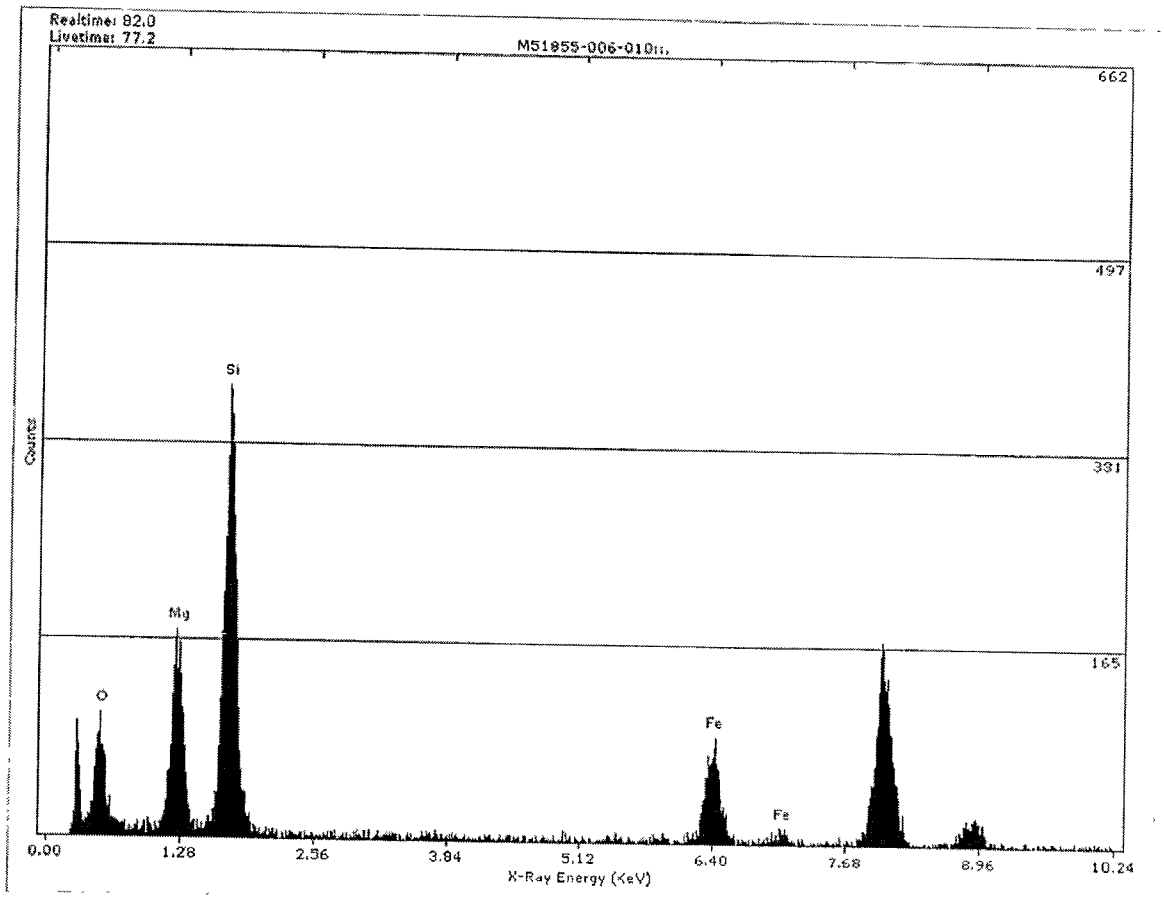

Realtime: 55.3
Livetime: 52.3
M51855-006-005.
359
269
179
89
Counts
Si
Mg
O
Fe
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)

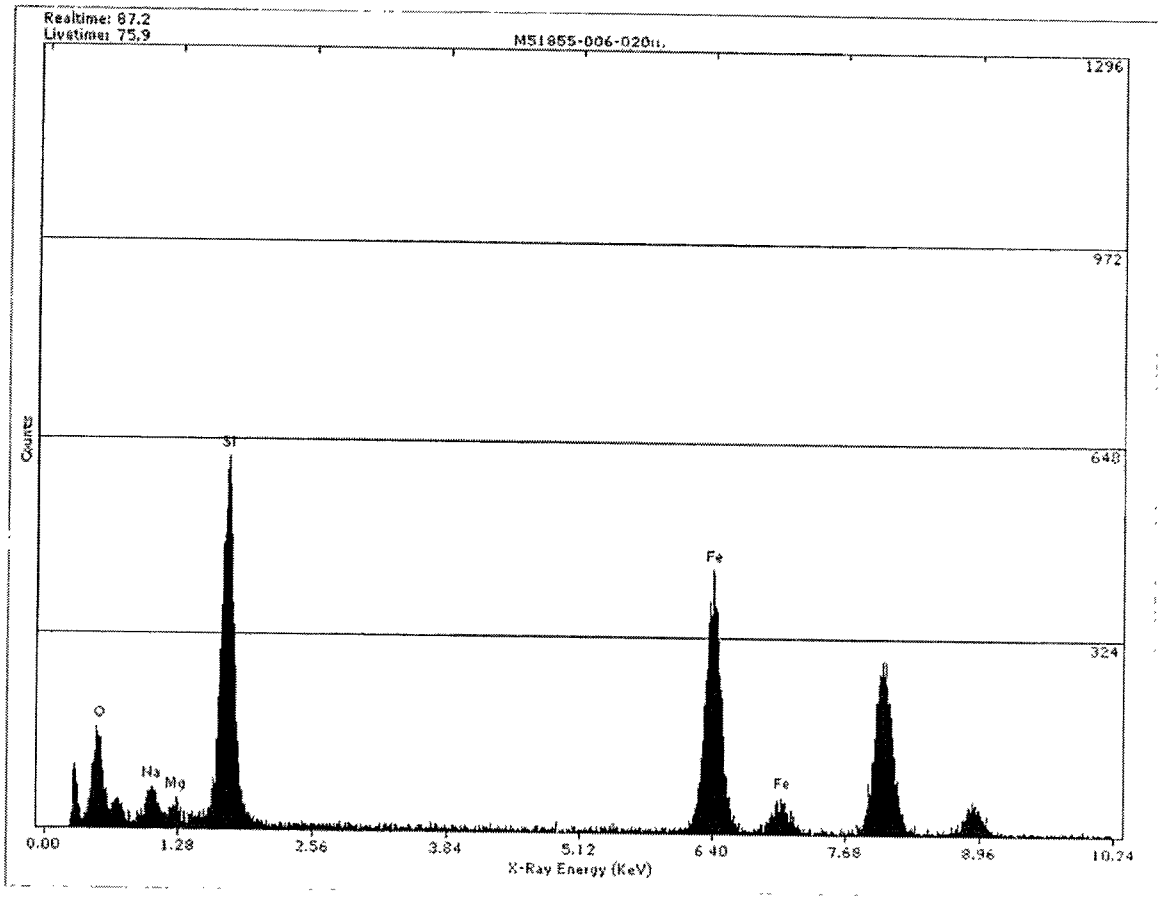

Realtime: 139.6
Livetime: 128.9
M51855-006-006::.
1991
1493
995
497
Counts
Si
Mg
O
Fe
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)


Realtime: 66.6
Livetime: 60.1
MS1855-006-007m.
976
732
488
244
Counts
Si
Mg
O
Fe
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)


Realtime: 72.5
Livetime: 69.2
M51855-006-008.
412
309
206
103
Counts
Si
Mg
O
Fe
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)


Realtime: 106.0
Livetime: 97.6
MS1855-006-009::.
1686
1265
843
421
Counts
Si
Mg
O
Fe
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)


Realtime: 82.0
Livetime: 77.2
M51855-006-010ii.
662
497
331
165
Counts
Si
Mg
O
Fe
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)


Realtime: 87.2
Livetime: 75.9
M51855-006-020
1296
972
648
324
Counts
Si
Fe
O
Na
Mg
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)

MAS, LLC.
PROJECT COC

MAS ID:	M51857	**Client Job No:**	
Client Name:	Materials Analytical Services Atlanta	**Client PO:**	
Project Name:	ECL AC Resin Pipe Cutting Electric Saw	**Date In:**	9/28/2010
Logged By:	ddmount	**Client Code:**	MASCORP

TRANSPORT INFORMATION:

Submitted By:	Michael Mount, CIH	**Documents:**	COC
Delivery By:	Hand Delivery		
Received By:	Nancy Sears	**Comments for COC:**	
Condition:	good		

CONTACT INFORMATION:

Contact: Bill Longo

Title:	First Name:	Last Name:	Suffix
Mr.	William	Longo	

Work Phone: (770) 866-3200 **Ext:**
Other Phone: **Ext:**
Fax: (770) 866-3259

SAMPLE INFORMATION:

#	Client ID	Volume	#	Client ID	Volume
000	lab blank	0			
001	A-02-A	460			
002	A-02-B	448			
003	A-02-C	445.5			
004	A-02-D	455			
005	P-2-A	3			
006	P-2-B	2.9			
007	P-2-C	3.05			
008	P-2-D	3.25			
009	A-2-A	10.2			
010	A-2-B	10.2			
011	A-2-C	10			
012	A-2-D	10.8			
013	A-2-E	900			
014	FB-2-1	0			
015	FB-2-2	0			

SIGNATURES

RECEIVED BY: Nancy Sears

Page 1 of 1

a12 CFM
71.8°F
63.1% RH

INDUSTRIAL HYGIENE AIR SAMPLING CHAIN OF CUSTODY

MAS

3945 Lakefield Court
Suwanee, GA 30024
Phone: 770-866-3200
Fax: 770-866-3259

COMPANY NAME: MAS, LLC - Dept 14
ADDRESS:
PHONE:
FAX:

PROJECT NUMBER:
PROJECT NAME: Haves Pipe Cutting - Electric Saw
WORK AREA DESCRIPTION: ECL - Study 2 - Steel Blade
PROJECT REPRESENTATIVE: Mike Mount
SAMPLING DATE: 9/27/10

AA 51857

TURNAROUND TIMES: _____ 1 DAY _____ 3 DAYS _____ STANDARD 5 –7 DAYS

DATE	SAMPLE NUMBER	SAMPLE LOCATION	SAMPLE MEDIA	ANALYSIS DESIRED	START TIME	STOP TIME	TOTAL TIME MINUTES	PRE FLOW RATE LPM	POST FLOW RATE LPM	AVG. FLOW RATE LPM	Total Volume Liters
9/27	A-02-A	Background, NE	0.8um MCE	7400, 7402	1:05	1:55	50	9.1	9.2	9.2	460
	B	SE						8.94	9.0	8.96	448
	C	SW						8.91	8.90	8.91	445.5
	D	NW						9.00	9.1	9.1	455
	P-2-A	Personal, On Worker, R		7402	2:12	2:17	5	.53	.66	.60	3.00
	B	L		7402				.51	.64	.58	2.90
	C	R						.62	.60	.61	3.05
	D	L						.62	.68	.65	3.25
	A-2-A	Area, During Cut, NE		7402				2.04	2.04	2.04	10.2
	B	SE		7402				2.00	2.07	2.04	10.2
	C	SW						2.00	2.00	2.00	10.0
	D	NW						2.16	2.21	2.16	10.8
	A-2-E	Outside ECL			1:35	3:05	90	10.0	10.0	10.	900
	FB-2-1	Field BLANK		7402							0
	FB-2-2			7402							0
	M51858										
	FAB-2-1	Shirt Fabric Before	Fabric	EPA Method							
	2-2	After									

CHAIN OF CUSTODY	NAME	COMPANY	MODE OF TRANSFER	LOG IN DATE	RECEIVED BY	COMPANY
First Transfer by:	Mike Mount	MAS, LLC,	Hand			
Second Transfer by:						
Third Transfer by:						

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

AC Resin Pipe Cutting, Study 2 -

MAS Project: Electric Saw, Steel Blade MAS Sample #: M51857-001

Client Sample ID: A-02-A Analysis Date: 9/28/10

0	0	0	0	0	0	
1	0	0	1	0	0	10
1	0	0	0	1	0	
0	0	0	0	0	0	20
0	0	0	0	0	0	
1	0	0	0	0	1	30
0	0	0	0	0	0	
0	0	0	0	0	0	40
0	0	0	0	0	0	
0	0	0	0	0	0	50
0	0	0	0	0	0	
0	0	0	0	0	0	60
0	0	0	0	0	0	
0	0	0	0	0	0	70
0.5	0	0	0	0	0.5	
0	0	0	0	0	0	80
1	0	1	0	0	0	
0	0	0	0	0	0	90
0	0	0	0	0	0	
0	0	0	0	0	0	100
4.5	0	1	1	1	1.5	4.5

Pump Flow Rate, Liters/Minute (FR)	**9.2**
Sample Time, Minutes (T)	**50**
Total Sample Volume, Liters (V)	**460**
Total Fibers Counted, Sample (FCS)	**4.5**
Total Fields Counted, Samples (FLS)	100
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 5.7 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= < 0.006 fibers/cm^3

Notes:

Media Type: 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased.

Analyst: W. B. Egeland Date: 9/28/2010

Reviewed By: M. Mount Date: 9/28/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

AC Resin Pipe Cutting, Study 2 -

MAS Project: Electric Saw, Steel Blade MAS Sample #: M51857-002

Client Sample ID: A-02-B Analysis Date: 9/28/10

0	0	0	0	0	0	
0	0	0	0	0	0	10
1	0	0	0	1	0	
0	0	0	0	0	0	20
0	0	0	0	0	0	
0	0	0	0	0	0	30
0	0	0	0	0	0	
0.5	0	0	0.5	0	0	40
0	0	0	0	0	0	
0	0	0	0	0	0	50
1	0	0	1	0	0	
0	0	0	0	0	0	60
0	0	0	0	0	0	
0	0	0	0	0	0	70
0	0	0	0	0	0	
0	0	0	0	0	0	80
0	0	0	0	0	0	
0	0	0	0	0	0	90
0	0	0	0	0	0	
1	0	0	0	1	0	100
3.5	0	0	1.5	2	0	3.5

Pump Flow Rate, Liters/Minute (FR)	8.96
Sample Time, Minutes (T)	50
Total Sample Volume, Liters (V)	448
Total Fibers Counted, Sample (FCS)	3.5
Total Fields Counted, Samples (FLS)	100
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 4.5 **fibers/mm^2**

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= < 0.006 **fibers/cm^3**

Notes:

Media Type. 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased.

Analyst: W. B. Egeland Date: 9/28/2010

Reviewed By: M. Mount Date: 9/28/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

AC Resin Pipe Cutting, Study 2 -

MAS Project: Electric Saw, Steel Blade MAS Sample #: M51857-003

Client Sample ID: A-02-C Analysis Date: 9/28/10

0	0	0	0	0	0	
1	0	0	0	1	0	10
0	0	0	0	0	0	
0	0	0	0	0	0	20
0	0	0	0	0	0	
1	0	0	1	0	0	30
0	0	0	0	0	0	
0	0	0	0	0	0	40
0	0	0	0	0	0	
1.5	1.5	0	0	0	0	50
0.5	0	0	0	0	0.5	
0	0	0	0	0	0	60
0	0	0	0	0	0	
0	0	0	0	0	0	70
0	0	0	0	0	0	
0	0	0	0	0	0	80
0	0	0	0	0	0	
1.5	0	1	0.5	0	0	90
0	0	0	0	0	0	
0	0	0	0	0	0	100
5.5	1.5	1	1.5	1	0.5	5.5

Pump Flow Rate, Liters/Minute (FR)	8.91
Sample Time, Minutes (T)	50
Total Sample Volume, Liters (V)	445.5
Total Fibers Counted, Sample (FCS)	5.5
Total Fields Counted, Samples (FLS)	100
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 7.0 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= 0.006 fibers/cm^3

Notes:

Media Type: 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased.

Analyst: W. B. Egeland Date: 9/28/2010

Reviewed By: M. Mount Date: 9/28/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

AC Resin Pipe Cutting, Study 2 -

MAS Project: Electric Saw, Steel Blade MAS Sample #: M51857-004

Client Sample ID: A-02-D Analysis Date: 9/28/10

0	0	0	0	0	0	
0.5	0.5	0	0	0	0	10
0	0	0	0	0	0	
1	0	0	0	0	1	20
0.5	0.5	0	0	0	0	
0	0	0	0	0	0	30
1	0	1	0	0	0	
0	0	0	0	0	0	40
0	0	0	0	0	0	
0	0	0	0	0	0	50
0	0	0	0	0	0	
0	0	0	0	0	0	60
0	0	0	0	0	0	
0	0	0	0	0	0	70
1	0	0	1	0	0	
0	0	0	0	0	0	80
0	0	0	0	0	0	
0	0	0	0	0	0	90
0	0	0	0	0	0	
0	0	0	0	0	0	100
4.0	1	1	1	0	1	4.0

Pump Flow Rate, Liters/Minute (FR)	**9.1**
Sample Time, Minutes (T)	**50**
Total Sample Volume, Liters (V)	**455**
Total Fibers Counted, Sample (FCS)	**4**
Total Fields Counted, Samples (FLS)	100
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 5.1 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= < 0.006 fibers/cm^3

Notes:

Media Type: 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased.

Analyst: W. B. Egeland Date: 9/28/2010

Reviewed By: M. Mount Date: 9/28/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

AC Resin Pipe Cutting, Study 2 -

MAS Project: Electric Saw, Steel Blade MAS Sample #: M51857-005

Client Sample ID: P-02-A Analysis Date: 9/28/10

16.5	3	2	4.5	0	7	
21.5	4	1	2	8	6.5	10
32.5	2	8.5	3	14	5	
18.5	5	6	5.5	1	1	20
15.5	5.5	1	2	7		
0						30
0						
0						40
0						
0						50
0						
0						60
0						
0						70
0						
0						80
0						
0						90
0						
0						100
104.5	19.5	18.5	17	30	19.5	104.5

Pump Flow Rate, Liters/Minute (FR)	0.6
Sample Time, Minutes (T)	5
Total Sample Volume, Liters (V)	3.0
Total Fibers Counted, Sample (FCS)	104.5
Total Fields Counted, Samples (FLS)	24
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 554.7 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= 71.2 fibers/cm^3

Notes:

Media Type: 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased.

Analyst: W. B. Egeland Date: 9/28/2010

Reviewed By: M. Mount Date: 9/28/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

AC Resin Pipe Cutting, Study 2 -

MAS Project: Electric Saw, Steel Blade MAS Sample #: M51857-006

Client Sample ID: P-02-B Analysis Date: 9/28/10

41	6.5	16	4	9.5	5	
28.5	8.5	3.5	8.5	3.5	4.5	10
24.5	2.5	4.5	6.5	7.5	3.5	
31.5	2.5	10	5.5	6.5	7	20
0						
0						30
0						
0						40
0						
0						50
0						
0						60
0						
0						70
0						
0						80
0						
0						90
0						
0						100
125.5	20	34	24.5	27	20	125.5

Pump Flow Rate, Liters/Minute (FR)	0.58
Sample Time, Minutes (T)	5
Total Sample Volume, Liters (V)	2.9
Total Fibers Counted, Sample (FCS)	125.5
Total Fields Counted, Samples (FLS)	20
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 799.4 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= 106.12 fibers/cm^3

Notes:

Media Type: 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased.

Analyst: W. B. Egeland Date: 9/28/2010

Reviewed By: M. Mount Date: 9/28/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

AC Resin Pipe Cutting, Study 2 -

MAS Project: Electric Saw, Steel Blade MAS Sample #: M51857-007

Client Sample ID: P-02-C Analysis Date: 9/28/10

27	7.5	3	8.5	4	4	
21.5	2.5	2.5	7	3.5	6	10
42	8	15.5	9	6	3.5	
35.5	11.5	8.5	2.5	3.5	9.5	20
0						
0						30
0						
0						40
0						
0						50
0						
0						60
0						
0						70
0						
0						80
0						
0						90
0						
0						100
126.0	29.5	29.5	27	17	23	126.0

Pump Flow Rate, Liters/Minute (FR)	0.61
Sample Time, Minutes (T)	5
Total Sample Volume, Liters (V)	3.05
Total Fibers Counted, Sample (FCS)	126
Total Fields Counted, Samples (FLS)	20
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) In Fibers/ mm^2

E= 802.5 fibers/mm^2

Calc. of Fiber Conc.(C) In Fibers/cm^3

C= 101.3 fibers/cm^3

Notes:

Media Type: 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased.

Analyst: W. B. Egeland Date: 9/28/2010

Reviewed By: M. Mount Date: 9/28/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

AC Resin Pipe Cutting, Study 2 ·

MAS Project: Electric Saw, Steel Blade MAS Sample #: M51857-008

Client Sample ID: P-2-D Analysis Date: 9/28/10

34	6	9.5	7.5	2.5	8.5	
30.5	4	4	6	6.5	10	10
31.5	9.5	7	4	6.5	4.5	
22.5	1.5	3.5	5	3.5	9	20
0						
0						30
0						
0						40
0						
0						50
0						
0						60
0						
0						70
0						
0						80
0						
0						90
0						
0						100
118.5	21	24	22.5	19	32	118.5

Pump Flow Rate, Liters/Minute (FR)	0.65
Sample Time, Minutes (T)	5
Total Sample Volume, Liters (V)	3.25
Total Fibers Counted, Sample (FCS)	118.5
Total Fields Counted, Samples (FLS)	20
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 754.8 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= 89.41 fibers/cm^3

Notes:

Media Type: 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased.

Analyst: W. B. Egeland Date: 9/28/2010

Reviewed By: M. Mount Date: 9/28/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

AC Resin Pipe Cutting, Study 2 -

MAS Project: Electric Saw, Steel Blade MAS Sample #: M51857-009

Client Sample ID: A-2-A Analysis Date: 9/28/10

51.5	9.5	9	13	10	10	
58	17	9	13.5	9.5	9	10
52.5	11.5	8	6.5	15	11.5	
48	12	16	7	7	6	20
0						
0						30
0						
0						40
0						
0						50
0						
0						60
0						
0						70
0						
0						80
0						
0						90
0						
0						100
210.0	50	42	40	41.5	36.5	210.0

Pump Flow Rate, Liters/Minute (FR)	**2.04**
Sample Time, Minutes (T)	**5**
Total Sample Volume, Liters (V)	**10.2**
Total Fibers Counted, Sample (FCS)	**210**
Total Fields Counted, Samples (FLS)	20
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 1337.6 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= 50.5 fibers/cm^3

Notes:

Media Type: 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased.

Analyst: W. B. Egeland Date: 9/28/2010

Reviewed By: M. Mount Date: 9/28/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

AC Resin Pipe Cutting, Study 2 -

MAS Project: Electric Saw, Steel Blade MAS Sample #: M51857-010

Client Sample ID: A-2-B Analysis Date: 9/28/10

46.5	9	10.5	8	11.5	7.5	
68	11.5	9.5	14	19.5	13.5	10
40	10.5	6	9.5	4.5	9.5	
37.5	10.5	8	6	6.5	6.5	20
0						
0						30
0						
0						
0						40
0						
0						50
0						
0						60
0						
0						70
0						
0						80
0						
0						90
0						
0						100
192.0	41.5	34	37.5	42	37	192.0

Pump Flow Rate, Liters/Minute (FR)	**2.04**
Sample Time, Minutes (T)	**5**
Total Sample Volume, Liters (V)	**10.2**
Total Fibers Counted, Sample (FCS)	**192**
Total Fields Counted, Samples (FLS)	20
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 1222.9 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= 46.2 fibers/cm^3

Notes:

Media Type: 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variablity and are probably biased.

Analyst: W. B. Egeland Date: 9/28/2010

Reviewed By: M. Mount Date: 9/28/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

AC Resin Pipe Cutting, Study 2 -

MAS Project: Electric Saw, Steel Blade MAS Sample #: M51857-011

Client Sample ID: A-2-C Analysis Date: 9/28/10

55.5	9	7	10	6	23.5	
51	11.5	6.5	11.5	16.5	5	10
41	13	8	6.5	8.5	5	
53	8.5	9.5	9	10	16	20
0						
0						30
0						
0						40
0						
0						50
0						
0						60
0						
0						70
0						
0						80
0						
0						90
0						
0						100
200.5	42	31	37	41	49.5	200.5

Pump Flow Rate, Liters/Minute (FR)	2
Sample Time, Minutes (T)	5
Total Sample Volume, Liters (V)	10
Total Fibers Counted, Sample (FCS)	200.5
Total Fields Counted, Samples (FLS)	20
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 1277.1 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= 49.17 fibers/cm^3

Notes:

Media Type: 25 mm MCE Filter

Limit of Quantitlon (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased.

Analyst: W. B. Egeland Date: 9/28/2010

Reviewed By: M. Mount Date: 9/28/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

AC Resin Pipe Cutting, Study 2 -

MAS Project: Electric Saw, Steel Blade MAS Sample #: M51857-012

Client Sample ID: A-2-D Analysis Date: 9/28/10

89	25.5	15.5	15	15.5	17.5	
83	15	12	16.5	19	20.5	10
67	13.5	15	13	14	11.5	
74	17.5	12.5	17.5	11	15.5	20
0						
0						30
0						
0						40
0						
0						50
0						
0						60
0						
0						70
0						
0						80
0						
0						90
0						
0						100
313.0	71.5	55	62	59.5	65	313.0

Pump Flow Rate, Liters/Minute (FR)	**2.16**
Sample Time, Minutes (T)	**5**
Total Sample Volume, Liters (V)	**10.8**
Total Fibers Counted, Sample (FCS)	313
Total Fields Counted, Samples (FLS)	20
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 1993.6 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= 71.1 fibers/cm^3

Notes:

Media Type: 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased.

Analyst: W. B. Egeland Date: 9/28/2010

Reviewed By: M. Mount Date: 9/28/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

AC Resin Pipe Cutting, Study 2 -

MAS Project: Electric Saw, Steel Blade MAS Sample #: M51857-013

Client Sample ID: A-2-E Analysis Date: 9/28/10

0.5	0	0	0.5	0	0	
0	0	0	0	0	0	10
0	0	0	0	0	0	
0	0	0	0	0	0	20
0	0	0	0	0	0	
2	1	0	1	0	0	30
0	0	0	0	0	0	
0	0	0	0	0	0	40
0	0	0	0	0	0	
0	0	0	0	0	0	50
0	0	0	0	0	0	
0	0	0	0	0	0	60
0.5	0	0	0.5	0	0	
0	0	0	0	0	0	70
0	0	0	0	0	0	
0	0	0	0	0	0	80
1.5	0	0	0	0.5	1	
2	1	0	1	0	0	90
1	0	0	0	0	1	
0	0	0	0	0	0	100
7.5	2	0	3	0.5	2	7.5

Pump Flow Rate, Liters/Minute (FR)	10
Sample Time, Minutes (T)	90
Total Sample Volume, Liters (V)	900
Total Fibers Counted, Sample (FCS)	7.5
Total Fields Counted, Samples (FLS)	100
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 9.6 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= 0.004 fibers/cm^3

Notes:

Media Type: 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased.

Analyst: W. B. Egeland Date: 9/28/2010

Reviewed By: M. Mount Date: 9/28/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

AC Resin Pipe Cutting, Study 2 -

MAS Project: Electric Saw, Steel Blade MAS Sample #: M51857-014

Client Sample ID. FB-2-1 Analysis Date: 9/28/10

0	0	0	0	0	0	
0	0	0	0	0	0	10
0	0	0	0	0	0	
0	0	0	0	0	0	20
0	0	0	0	0	0	
0	0	0	0	0	0	30
0	0	0	0	0	0	
0	0	0	0	0	0	40
0	0	0	0	0	0	
0	0	0	0	0	0	50
0	0	0	0	0	0	
0	0	0	0	0	0	60
0	0	0	0	0	0	
0	0	0	0	0	0	70
0	0	0	0	0	0	
0	0	0	0	0	0	80
0	0	0	0	0	0	
0	0	0	0	0	0	90
0	0	0	0	0	0	
0	0	0	0	0	0	100
0.0	0	0	0	0	0	0.0

Pump Flow Rate, Liters/Minute (FR)	0
Sample Time, Minutes (T)	0
Total Sample Volume, Liters (V)	0
Total Fibers Counted, Sample (FCS)	0
Total Fields Counted, Samples (FLS)	100
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 0.0 **fibers/mm^2**

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= NA fibers/cm^3

Notes:

Media Type 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased

Analyst: W. B. Egeland Date: 9/28/2010

Reviewed By: M Mount Date: 9/28/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

AC Resin Pipe Cutting, Study 2 -

MAS Project: Electric Saw, Steel Blade MAS Sample #: M51857-015

Client Sample ID: FB-2-2 Analysis Date: 9/28/10

0	0	0	0	0	0	
0	0	0	0	0	0	10
0	0	0	0	0	0	
0	0	0	0	0	0	20
1	0	1	0	0	0	
0	0	0	0	0	0	30
0	0	0	0	0	0	
0	0	0	0	0	0	40
0	0	0	0	0	0	
0	0	0	0	0	0	50
0	0	0	0	0	0	
0	0	0	0	0	0	60
0	0	0	0	0	0	
1	0	0	0	0	1	70
0	0	0	0	0	0	
0	0	0	0	0	0	80
0	0	0	0	0	0	
0	0	0	0	0	0	90
0	0	0	0	0	0	
0	0	0	0	0	0	100
2.0	0	1	0	0	1	2.0

Pump Flow Rate, Liters/Minute (FR)	0
Sample Time, Minutes (T)	0
Total Sample Volume, Liters (V)	0
Total Fibers Counted, Sample (FCS)	2
Total Fields Counted, Samples (FLS)	100
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 2.5 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= NA fibers/cm^3

Notes:

Media Type: 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased

Analyst: W. B. Egeland Date: 9/28/2010

Reviewed By: M Mount Date: 9/28/2010

MAS TEM ANALYSIS M51857-005

CLIENT NAME: Materials Analytical Services Atlanta CLIENT SAMPLE ID: P-2-A

7402 ANALYSIS

Sample Area/ Volume:	3	Liters	Date Analyzed:	10/1/2010	
Filter Type:	MCE 25mm		Analyst:	Mehrdad Motamedi	
Pore size:	0.8		Scope Number:	4	
Effective Filter Area:	385		Accelerating Voltage:	100	KV
Sample type:	Air		Indicated Mag:	25	KX
Analysis type:	7402		Screen Mag:	20	KX
Grid Acceptance	YES	5 %	Grid_box:	7809	

Number of grids:	2	#1:	108	#3:	108	Asbestos	101
Number of openings:	22	#2:	106	#4:	108	Non-asbestos	0

Average Grid Size: 0.011556 Total Area Analyzed: 0.254

% Asbestos 100

Str#.	squareID	Fiber Type	Size		Morph	SAED	EDS
1	E1-F1	Anthophylite	36.5	0.5	Amphibole	Amphibole	✓
2	F2	Crocidolite	19	0.4	Amphibole	Amphibole	✓
3		Crocidolite	6	0.4	Amphibole	Amphibole	✓
4		Anthophylite	5.8	0.5	Amphibole	Amphibole	✓
5		Anthophylite	8	0.6	Amphibole	Amphibole	✓
6	F3	Crocidolite	9	0.4	Amphibole	Amphibole	✓
7		Anthophylite	6.5	0.8	Amphibole	Amphibole	✓
8		Crocidolite	5.5	0.3	Amphibole	Amphibole	✓
9	F4	Crocidolite	6	0.4	Amphibole	Amphibole	✓
10	F5	Crocidolite	11	0.3	Amphibole	Amphibole	✓
11		Anthophylite	7	0.6	Amphibole	Amphibole	
12	F6	Crocidolite	14	1	Amphibole	Amphibole	
13		Anthophylite	14	0.9	Amphibole	Amphibole	
14		Crocidolite	22.5	0.5	Amphibole	Amphibole	
15		Crocidolite	15	0.8	Amphibole	Amphibole	
16		Crocidolite	24	1.5	Amphibole	Amphibole	
17	F7	Anthophylite	8.5	0.8	Amphibole	Amphibole	
18		Anthophylite	12	1	Amphibole	Amphibole	
19		Anthophylite	8	0.8	Amphibole	Amphibole	
20		Crocidolite	31	0.8	Amphibole	Amphibole	✓
21		Crocidolite	14	0.7	Amphibole	Amphibole	
22		Crocidolite	20	0.5	Amphibole	Amphibole	
23		Crocidolite	8	0.4	Amphibole	Amphibole	
24		Anthophylite	12	1.5	Amphibole	Amphibole	
25	F8	Anthophylite	6	1	Amphibole	Amphibole	
26		Crocidolite	13	1	Amphibole	Amphibole	
27	F9	Crocidolite	6	0.4	Amphibole	Amphibole	
28		Crocidolite	28	2	Amphibole	Amphibole	

29			Anthophylite	7	0.8	Amphibole	Amphibole	
NSD	G10							
30	G9		Anthophylite	42	0.5	Amphibole	Amphibole	✓
31			Crocidolite	16	3	Amphibole	Amphibole	
32	G8		Crocidolite	9	0.4	Amphibole	Amphibole	
33			Crocidolite	5.8	0.3	Amphibole	Amphibole	
34			Anthophylite	6.5	0.9	Amphibole	Amphibole	
35	G7		Crocidolite	9	0.3	Amphibole	Amphibole	
36			Anthophylite	8	1	Amphibole	Amphibole	
37			Anthophylite	11	1.5	Amphibole	Amphibole	
38			Anthophylite	6	0.8	Amphibole	Amphibole	
39			Anthophylite	6.5	0.3	Amphibole	Amphibole	
40			Crocidolite	7	0.3	Amphibole	Amphibole	✓
41	G6		Anthophylite	6.6	0.4	Amphibole	Amphibole	
42			Crocidolite	8	0.4	Amphibole	Amphibole	
43	G5		Crocidolite	20	2	Amphibole	Amphibole	
44			Crocidolite	23	0.7	Amphibole	Amphibole	
45			Anthophylite	5.7	0.4	Amphibole	Amphibole	
46			Crocidolite	5 8	0.4	Amphibole	Amphibole	
47			Anthophylite	5.8	0.4	Amphibole	Amphibole	
48			Crocidolite	6	0.4	Amphibole	Amphibole	
49			Crocidolite	11.5	0.4	Amphibole	Amphibole	
50			Anthophylite	7	0.3	Amphibole	Amphibole	✓
51	G4		Anthophylite	28	0.7	Amphibole	Amphibole	
52			Anthophylite	12	1	Amphibole	Amphibole	
53			Anthophylite	12	0.4	Amphibole	Amphibole	
54			Anthophylite	12	1	Amphibole	Amphibole	
55			Crocidolite	18	0.9	Amphibole	Amphibole	
56			Crocidolite	17 5	0.7	Amphibole	Amphibole	
57			Crocidolite	7	0.7	Amphibole	Amphibole	
58			Anthophylite	9	0.9	Amphibole	Amphibole	
59	E2-I4		Anthophylite	8	0.4	Amphibole	Amphibole	
60			Crocidolite	16	0.5	Amphibole	Amphibole	✓
61			Anthophylite	9	0.8	Amphibole	Amphibole	
62			Crocidolite	9	0.6	Amphibole	Amphibole	
63			Anthophylite	10	1.5	Amphibole	Amphibole	
64	I5		Crocidolite	8	1.5	Amphibole	Amphibole	
65			Crocidolite	12	0.5	Amphibole	Amphibole	
66			Crocidolite	12	1	Amphibole	Amphibole	
67			Anthophylite	6	0.9	Amphibole	Amphibole	
68			Crocidolite	8	1	Amphibole	Amphibole	
69			Crocidolite	11	0.4	Amphibole	Amphibole	
70	I6		Crocidolite	36	3	Amphibole	Amphibole	✓
71			Crocidolite	16	2	Amphibole	Amphibole	
72			Crocidolite	12	1.5	Amphibole	Amphibole	
73			Crocidolite	10	1	Amphibole	Amphibole	
74			Crocidolite	6	0.3	Amphibole	Amphibole	
75			Crocidolite	24.5	0.9	Amphibole	Amphibole	
76			Anthophylite	10	0.6	Amphibole	Amphibole	
77			Anthophylite	7	0.9	Amphibole	Amphibole	
78			Anthophylite	7	1.5	Amphibole	Amphibole	
79			Crocidolite	9.8	0.3	Amphibole	Amphibole	
80			Crocidolite	5.8	0.8	Amphibole	Amphibole	✓
81			Anthophylite	8.5	0.4	Amphibole	Amphibole	

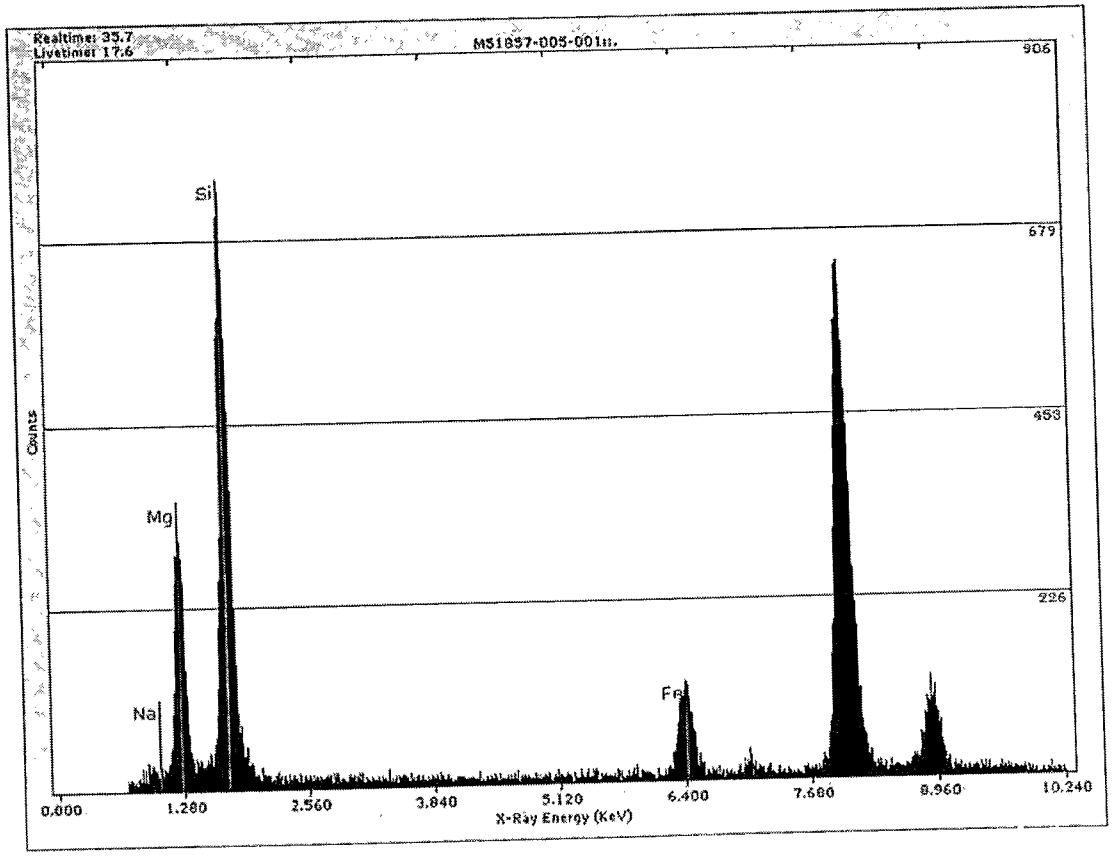
82			Anthophylite	10	0.6	Amphibole	Amphibole	
83	I7		Crocidolite	12	0.8	Amphibole	Amphibole	
84	I8		Crocidolite	24	0.34	Amphibole	Amphibole	
85			Crocidolite	10	0.6	Amphibole	Amphibole	
86	I9		Anthophylite	7.5	0 4	Amphibole	Amphibole	
87			Anthophylite	6	0.5	Amphibole	Amphibole	
88			Crocidolite	6	0.5	Amphibole	Amphibole	
89			Crocidolite	14	0.8	Amphibole	Amphibole	
90			Anthophylite	7.6	0.4	Amphibole	Amphibole	✓
91			Crocidolite	6	0.4	Amphibole	Amphibole	
92			Crocidolite	12.5	0.4	Amphibole	Amphibole	
93			Anthophylite	12	0.8	Amphibole	Amphibole	
94			Crocidolite	8	2	Amphibole	Amphibole	
95			Anthophylite	6.3	0.5	Amphibole	Amphibole	
96			Crocidolite	7	0.3	Amphibole	Amphibole	
97			Anthophylite	22	1.5	Amphibole	Amphibole	
98			Crocidolite	35	0.7	Amphibole	Amphibole	
99			Anthophylite	15	2	Amphibole	Amphibole	
100			Anthophylite	8	1	Amphibole	Amphibole	✓
101			Anthophylite	7.5	0.4	Amphibole	Amphibole	

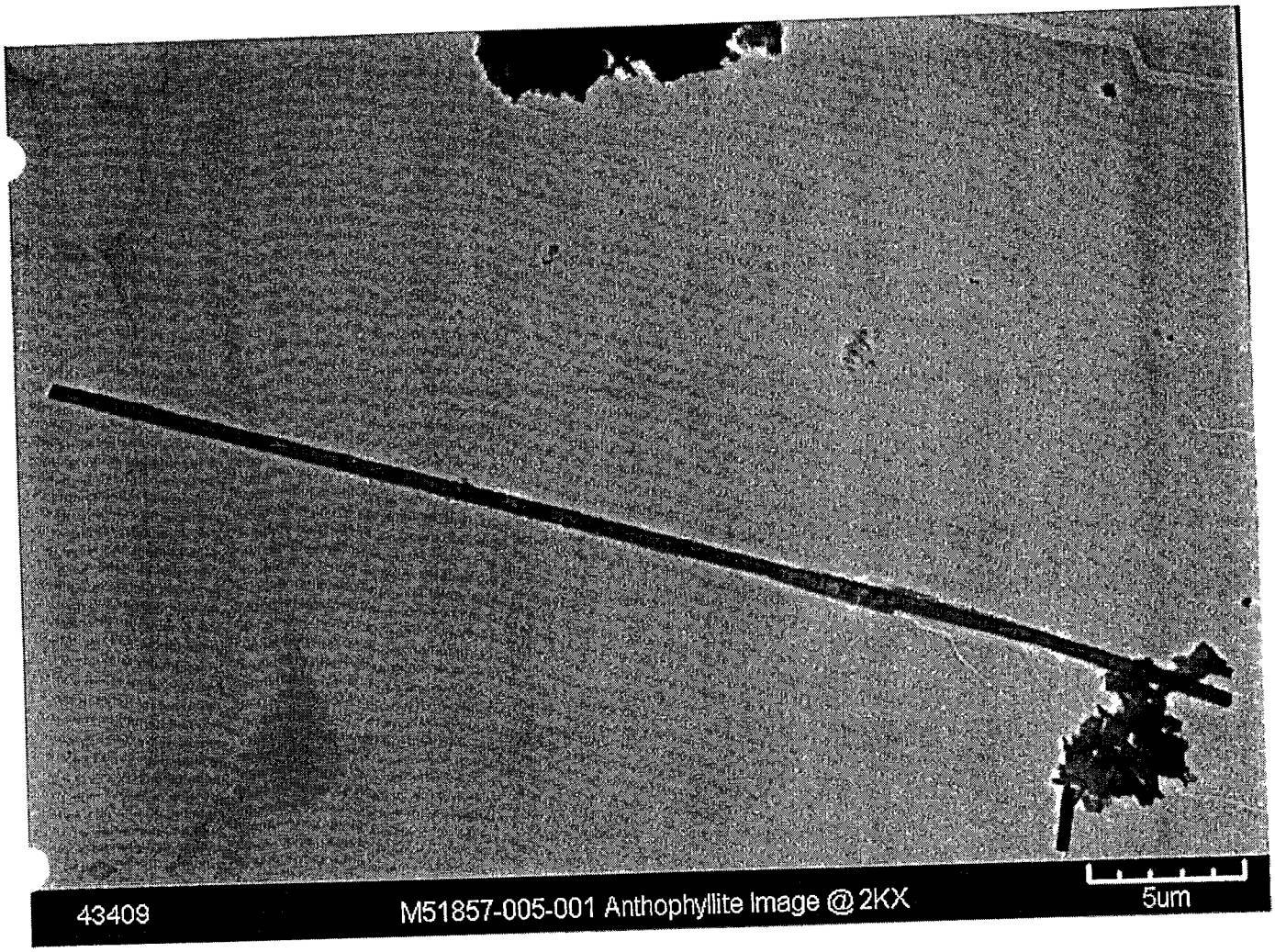
Grid Op

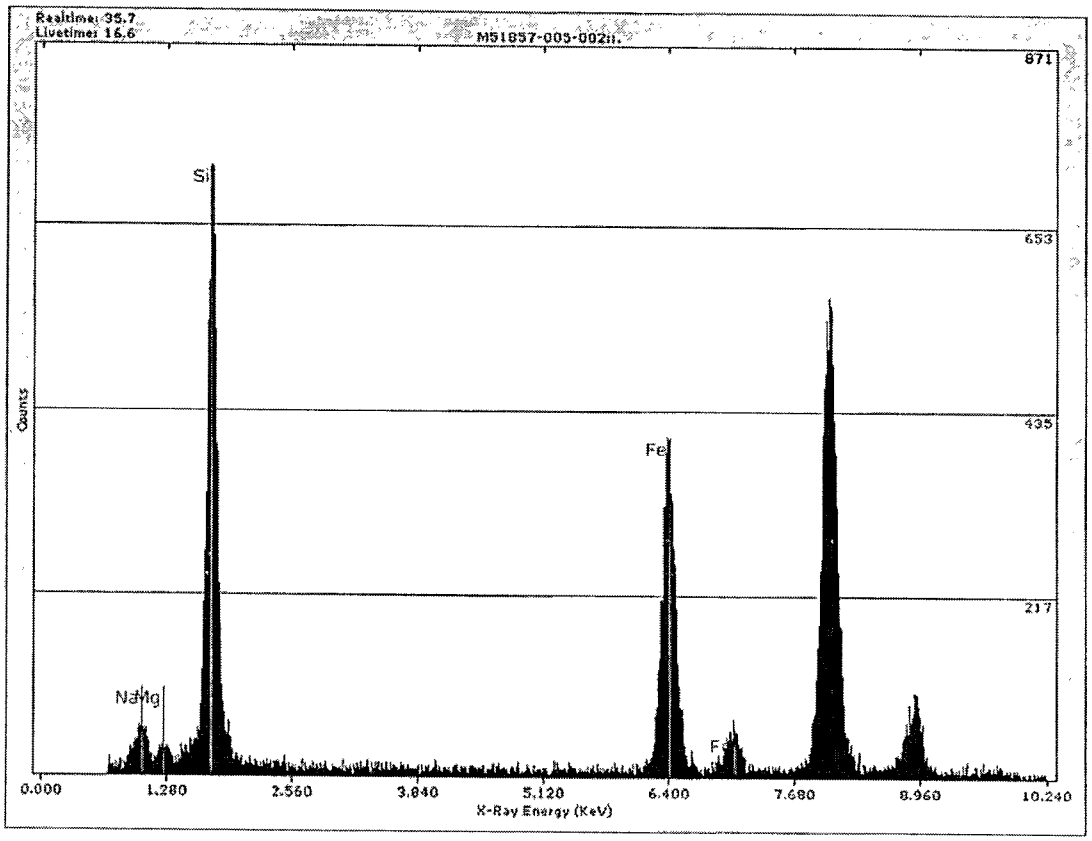
22

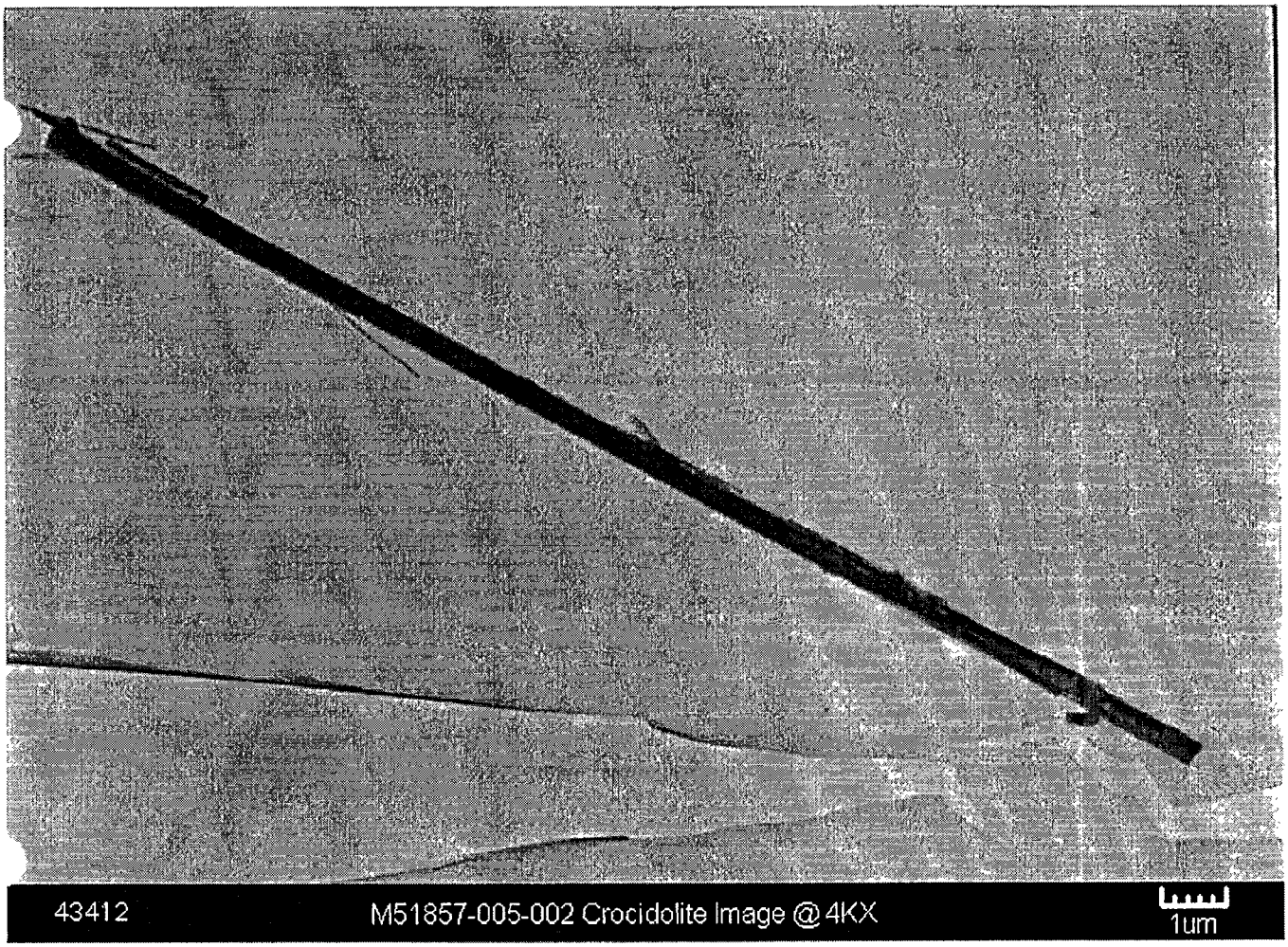
M51857 005 Sample Comments:

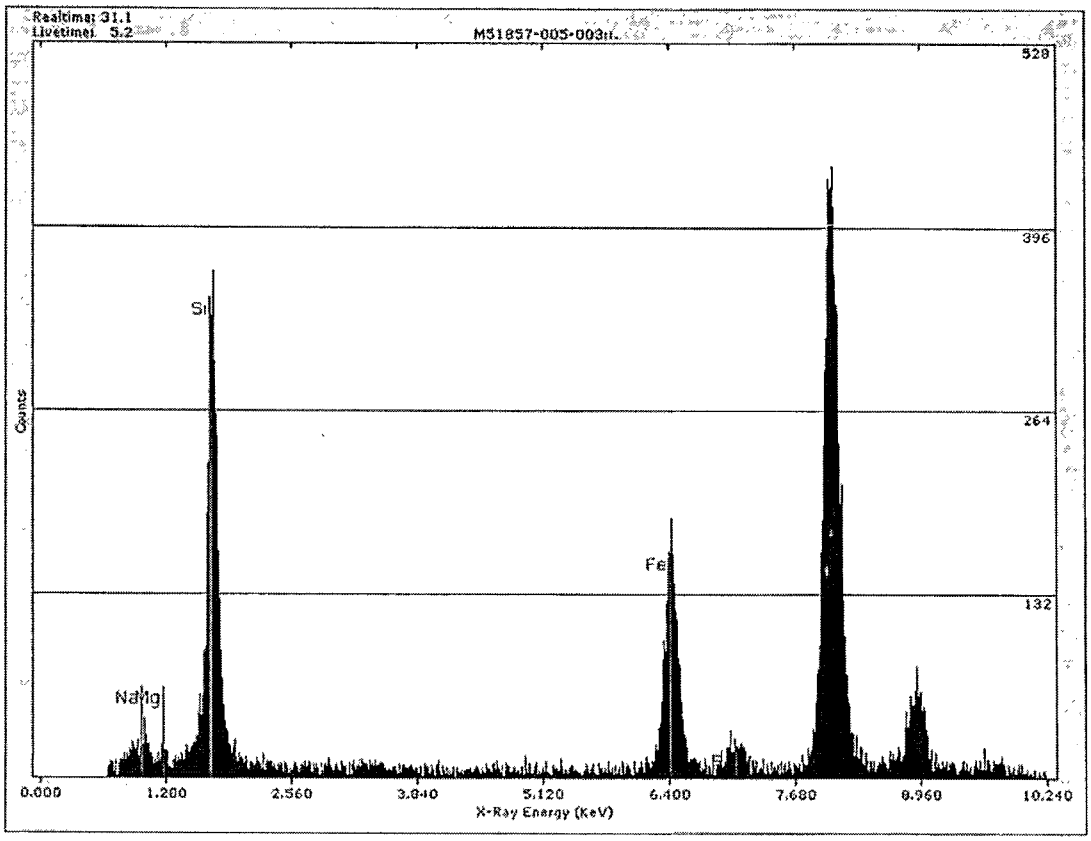
personal right

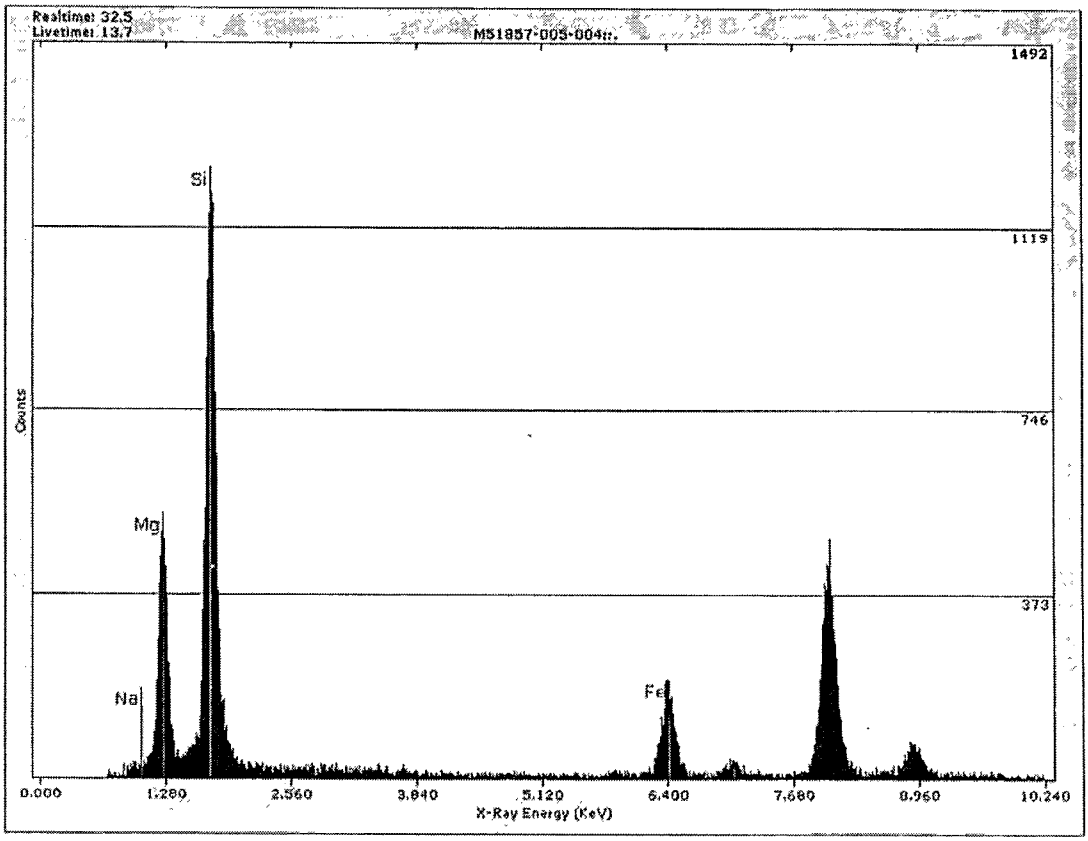

Realtime: 35.7
Livetime: 17.6
MS1897-005-001.
906
679
453
226
Counts
Si
Mg
Na
Fe
0.000
1.280
2.560
3.840
5.120
6.400
7.680
8.960
10.240
X-Ray Energy (KeV)

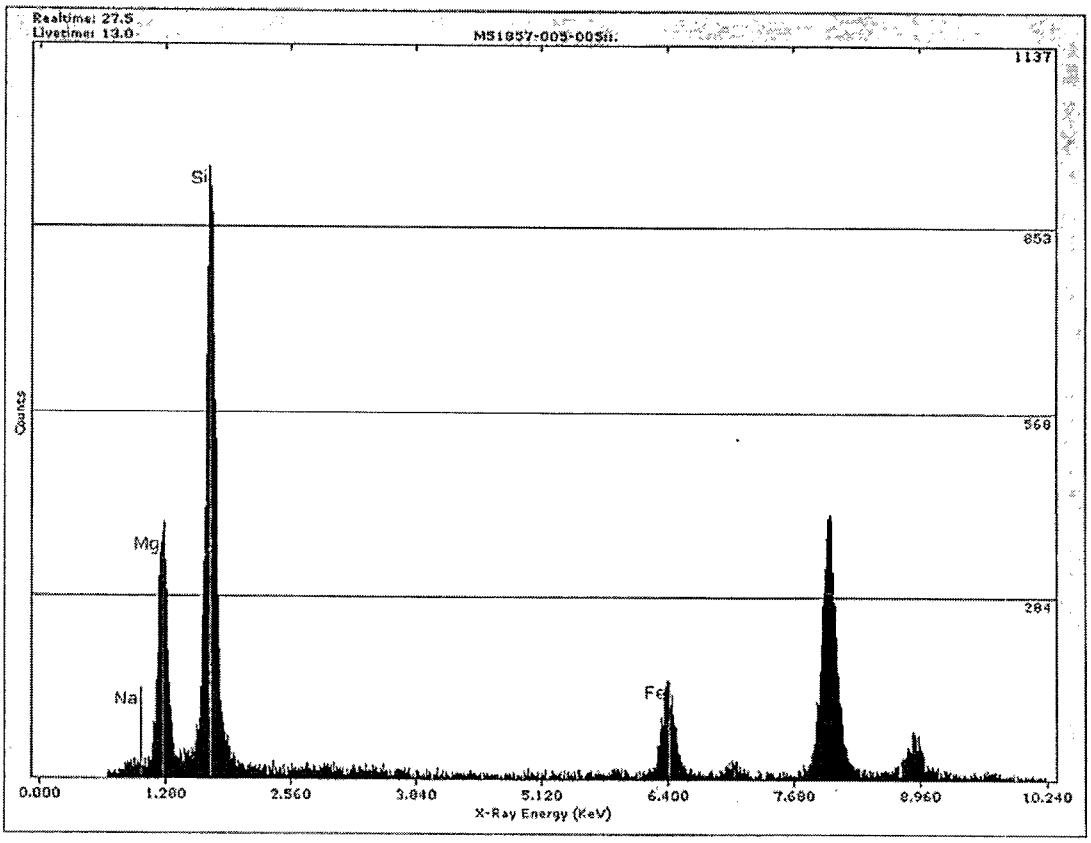

43409
M51857-005-001 Anthophyllite Image @ 2KX
5um

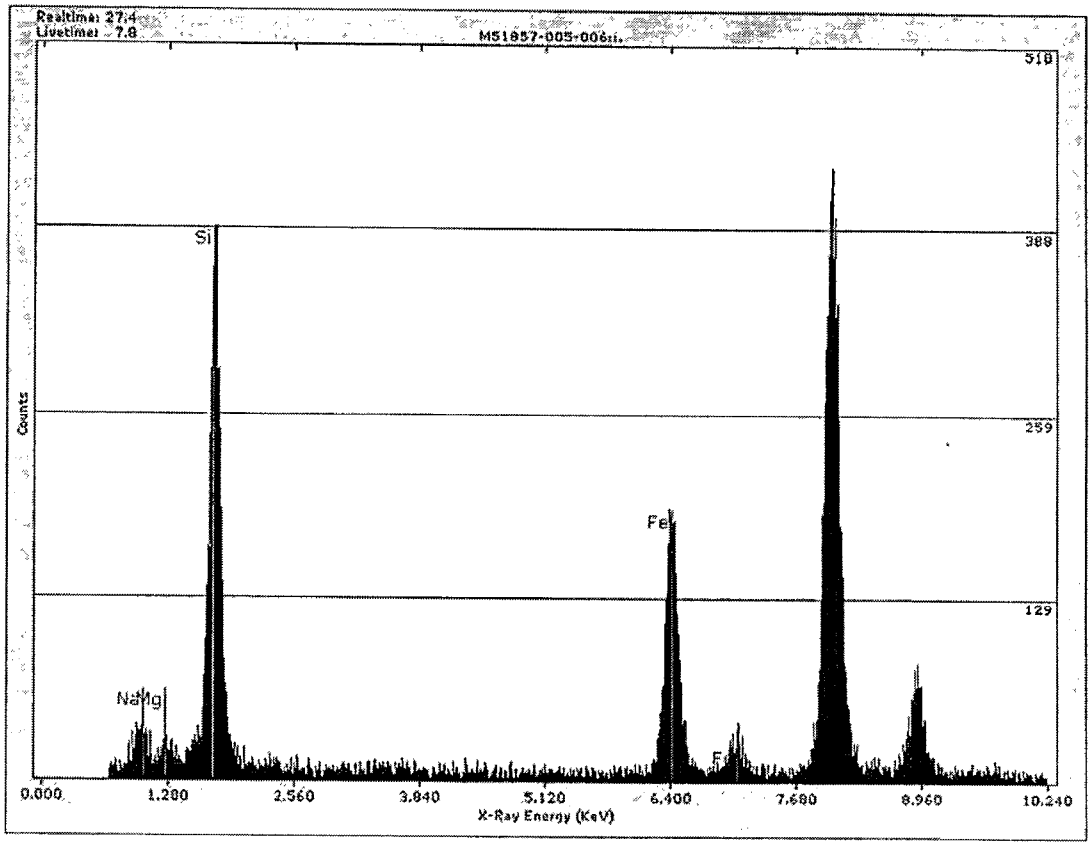

Realtime: 35.7
Livetime: 16.6
M51857-005-002II.
871
653
435
217
Counts
Si
Fe
Na
Mg
F
0.000
1.280
2.560
3.840
5.120
6.400
7.680
8.960
10.240
X-Ray Energy (KeV)

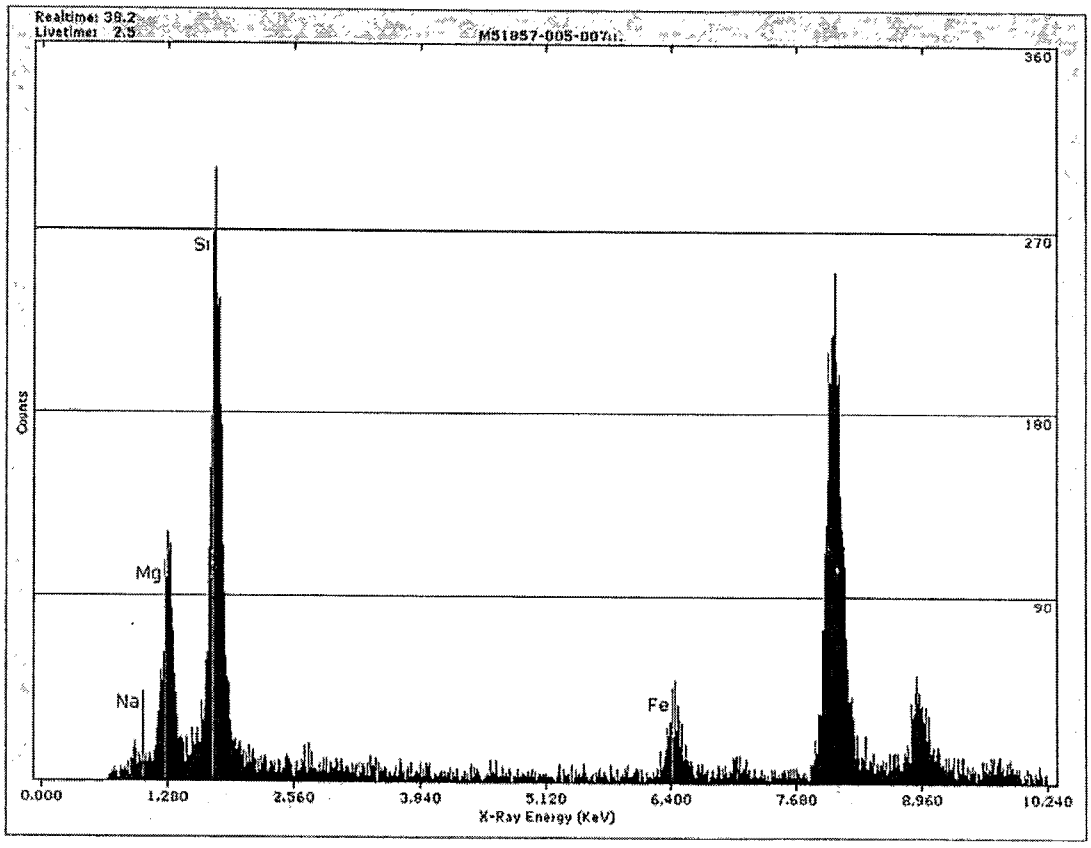

43412
M51857-005-002 Crocidolite Image @ 4KX
1um

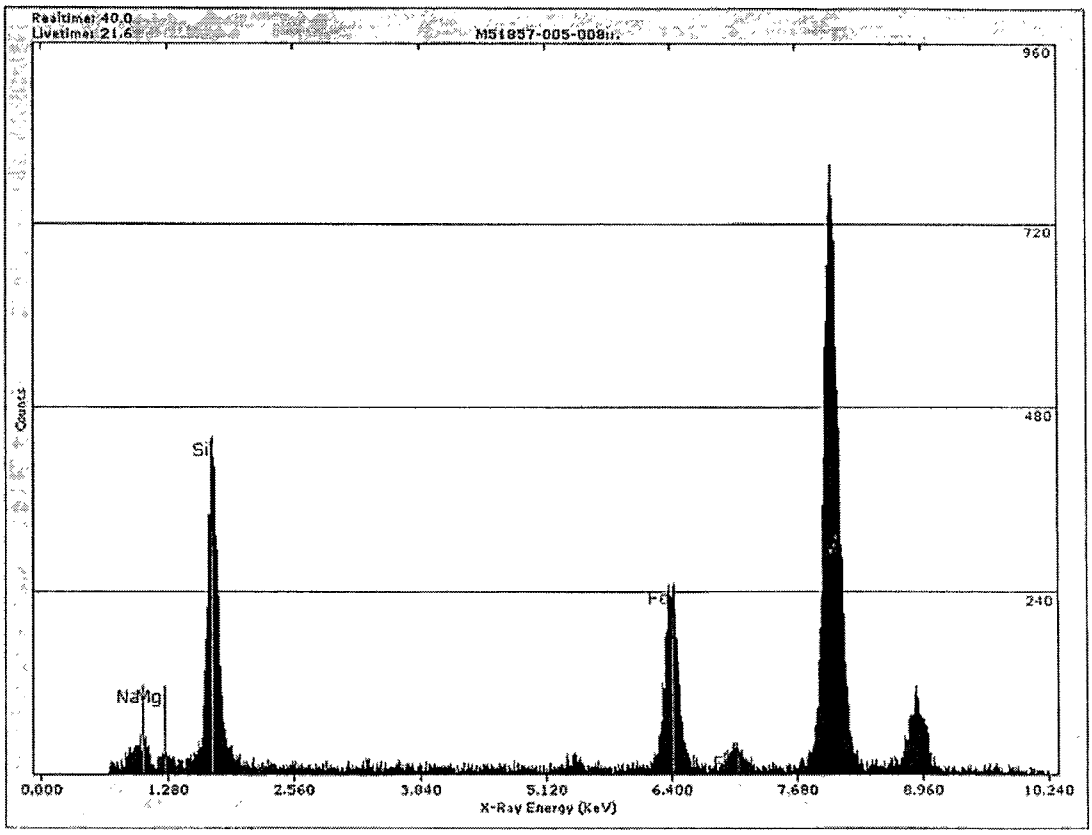

Realtime: 31.1
Livetime: 5.2
M51857-005-003.
528
396
264
132
Counts
Si
Fe
Na Mg
0.000
1.280
2.560
3.840
5.120
6.400
7.680
8.960
10.240
X-Ray Energy (KeV)

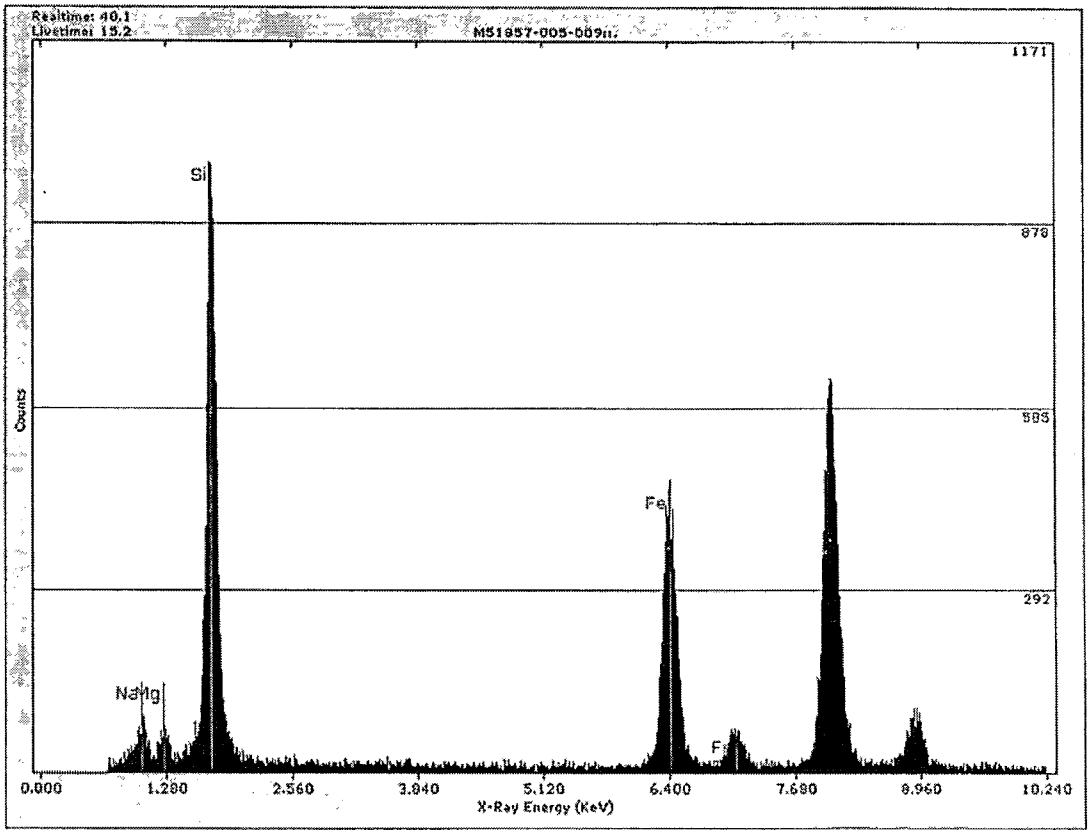

Realtime: 32.5
Livetime: 13.7
M51857-005-004::.
1492
1119
746
373
Counts
Si
Mg
Na
Fe
0.000
1.280
2.560
3.840
5.120
6.400
7.680
8.960
10.240
X-Ray Energy (KeV)

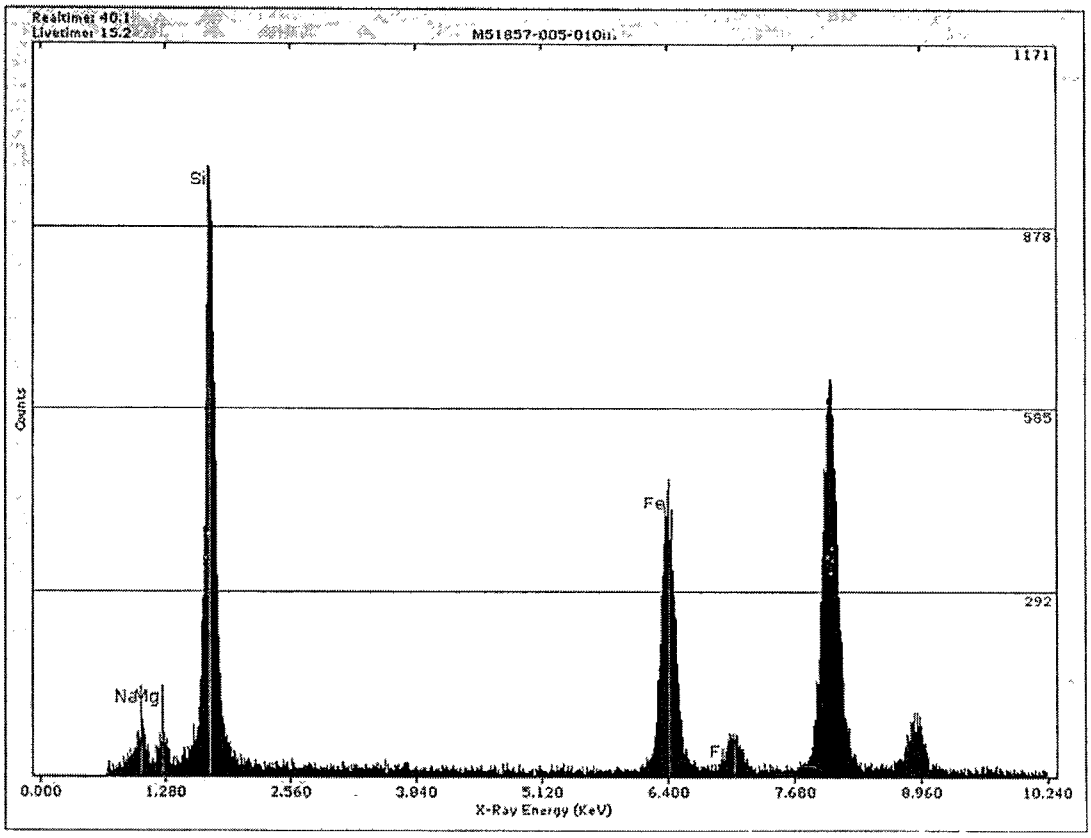

Realtime: 27.5
Livetime: 13.0
MS1857-005-005ii.
1137
853
568
284
Counts
Si
Mg
Na
Fe
0.000
1.280
2.560
3.840
5.120
6.400
7.680
8.960
10.240
X-Ray Energy (KeV)

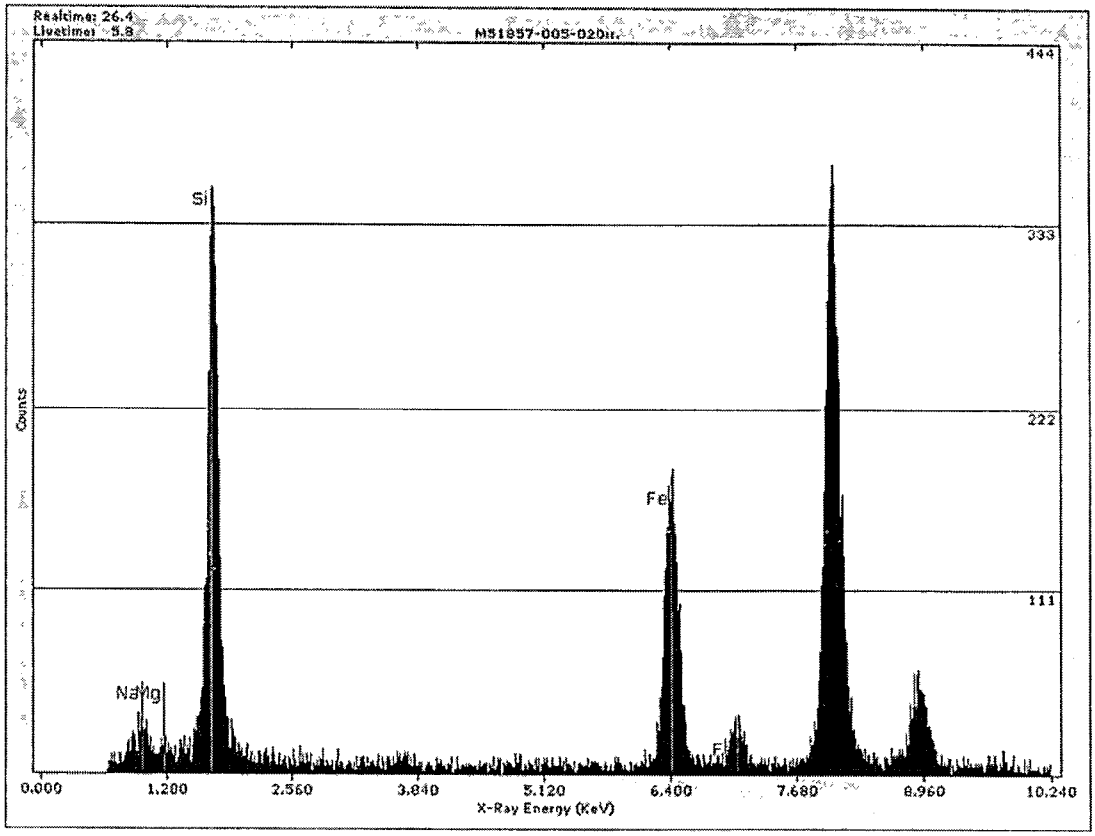

Realtime: 27.4
Livetime: 7.8
MS1857-005-006ti.
518
388
259
129
Counts
Si
Fe
Na Mg
F
0.000
1.280
2.560
3.840
5.120
6.400
7.680
8.960
10.240
X-Ray Energy (KeV)

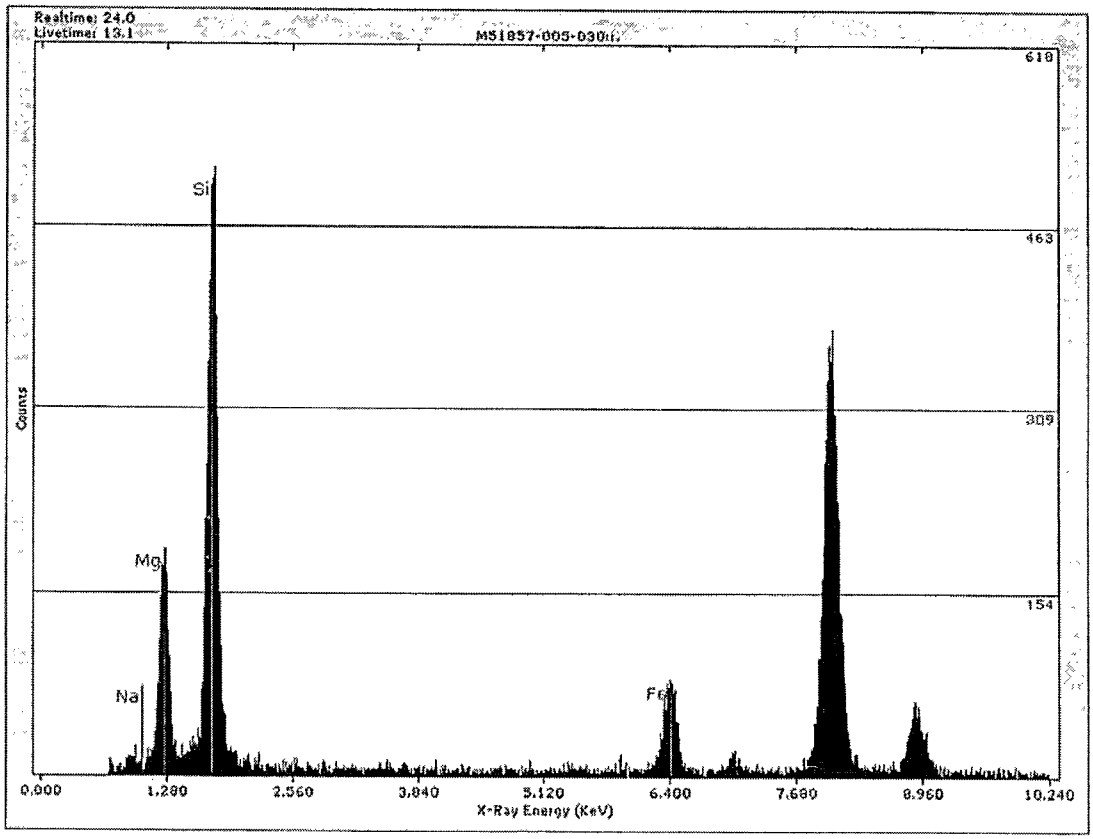

Realtime: 38.2
Livetime: 2.5
M51857-005-007
360
270
180
90
Counts
Si
Mg
Na
Fe
0.000
1.280
2.560
3.840
5.120
6.400
7.680
8.960
10.240
X-Ray Energy (KeV)

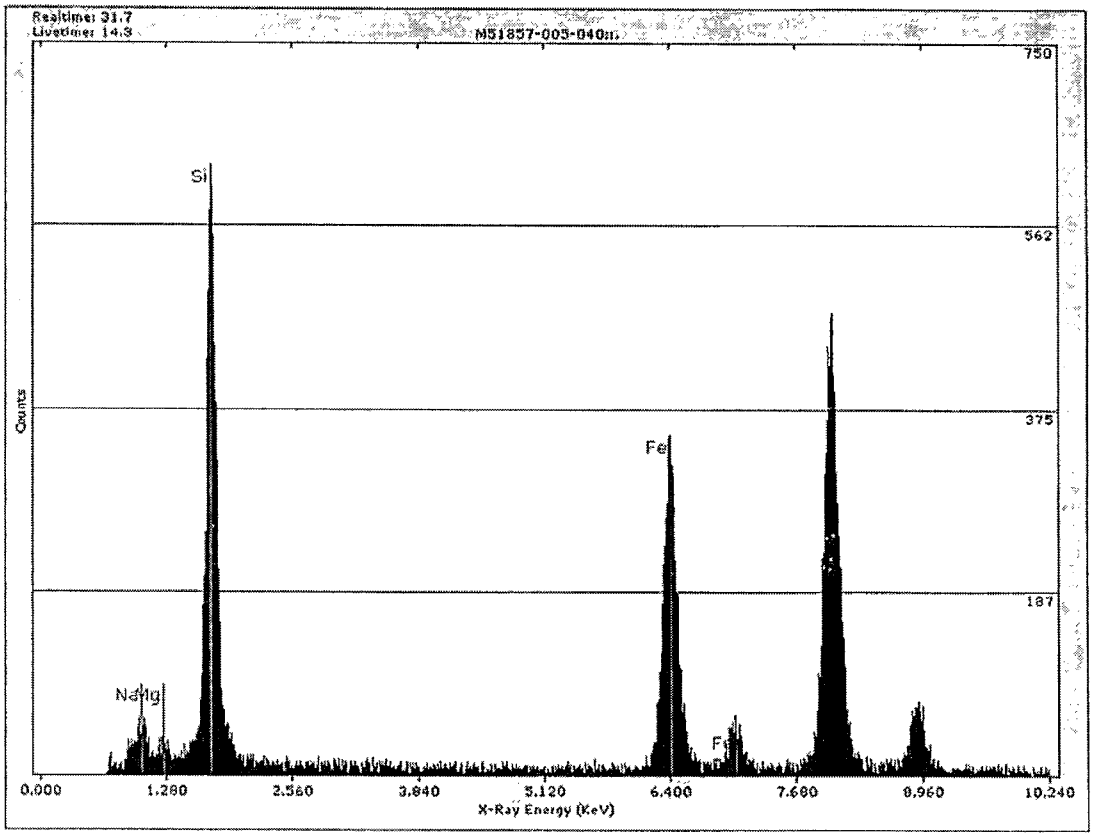

Realtime: 40.0
Livetime: 21.6
M51857-005-009.
960
720
480
240
Counts
Si
Fe
Na
Mg
0.000
1.280
2.560
3.840
5.120
6.400
7.680
8.960
10.240
X-Ray Energy (KeV)

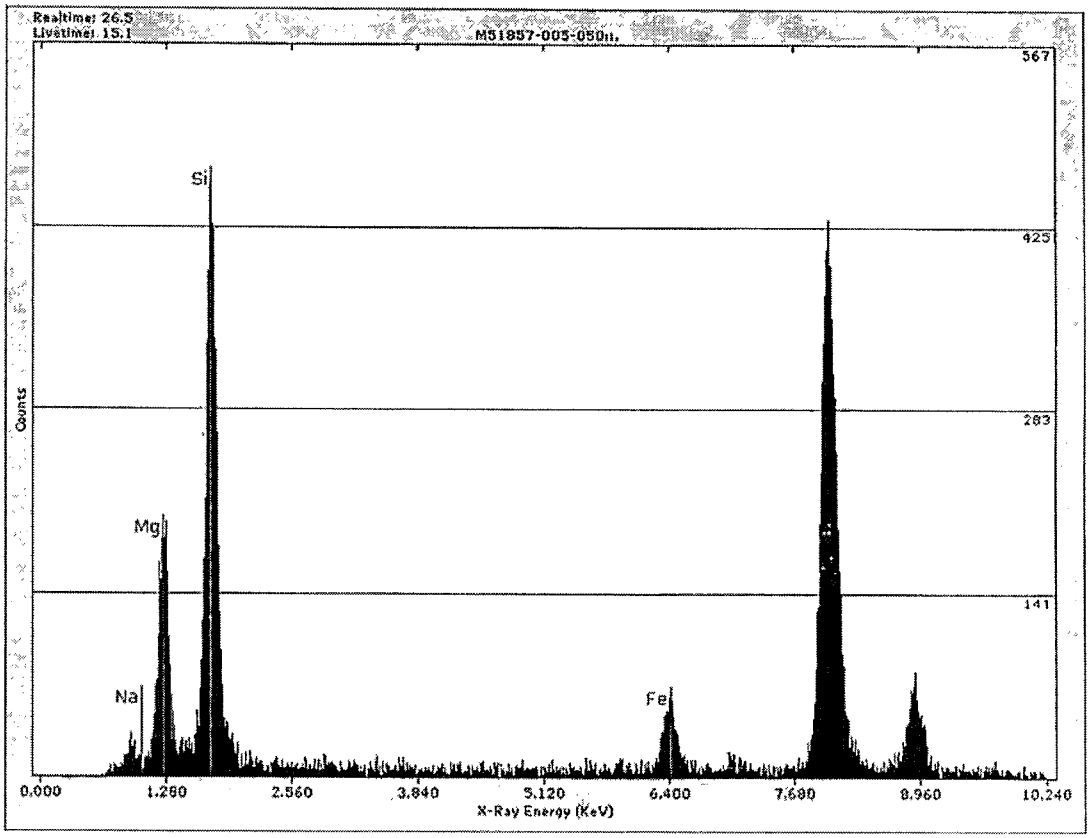

Realtime: 40.1
Livetime: 15.2
M51857-005-009.n7
1171
879
585
292
Counts
Si
Fe
Na
Mg
F
0.000
1.280
2.560
3.840
5.120
6.400
7.680
8.960
10.240
X-Ray Energy (KeV)

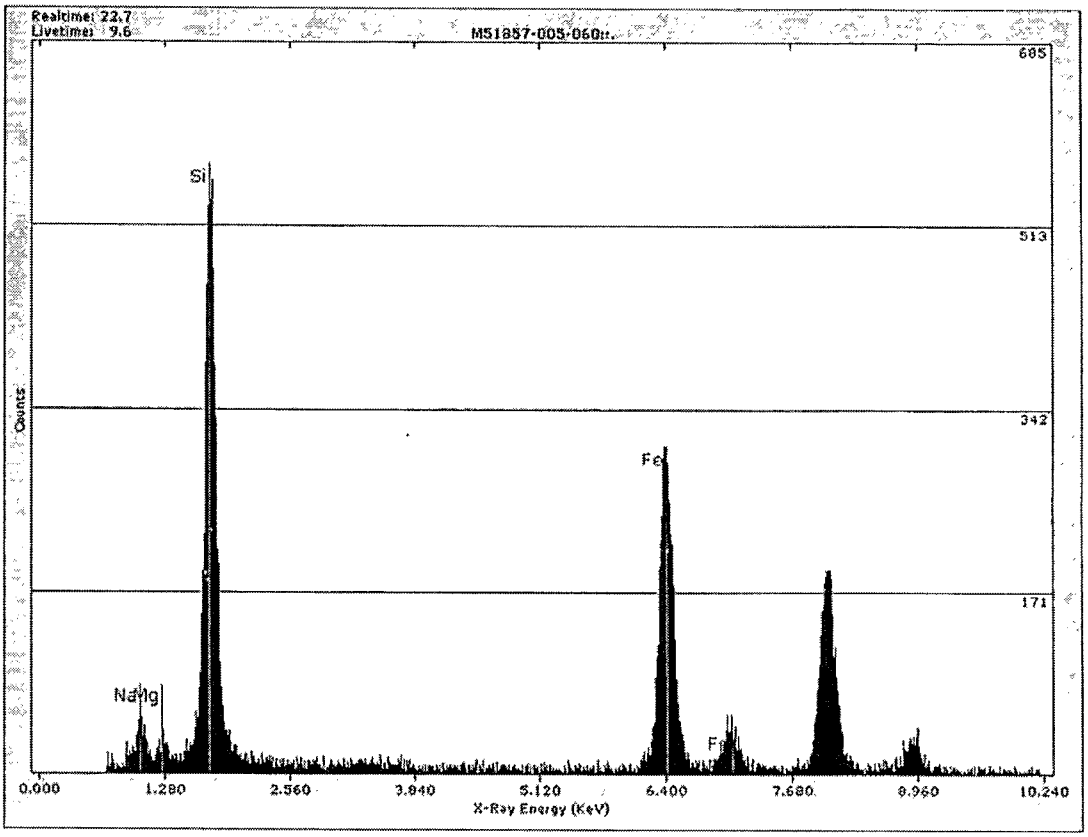

Realtime: 40.1
Livetime: 15.2
M51857-005-010a.
1171
878
585
292
Counts
Si
Fe
Na
Mg
F
0.000
1.280
2.560
3.840
5.120
6.400
7.680
8.960
10.240
X-Ray Energy (KeV)

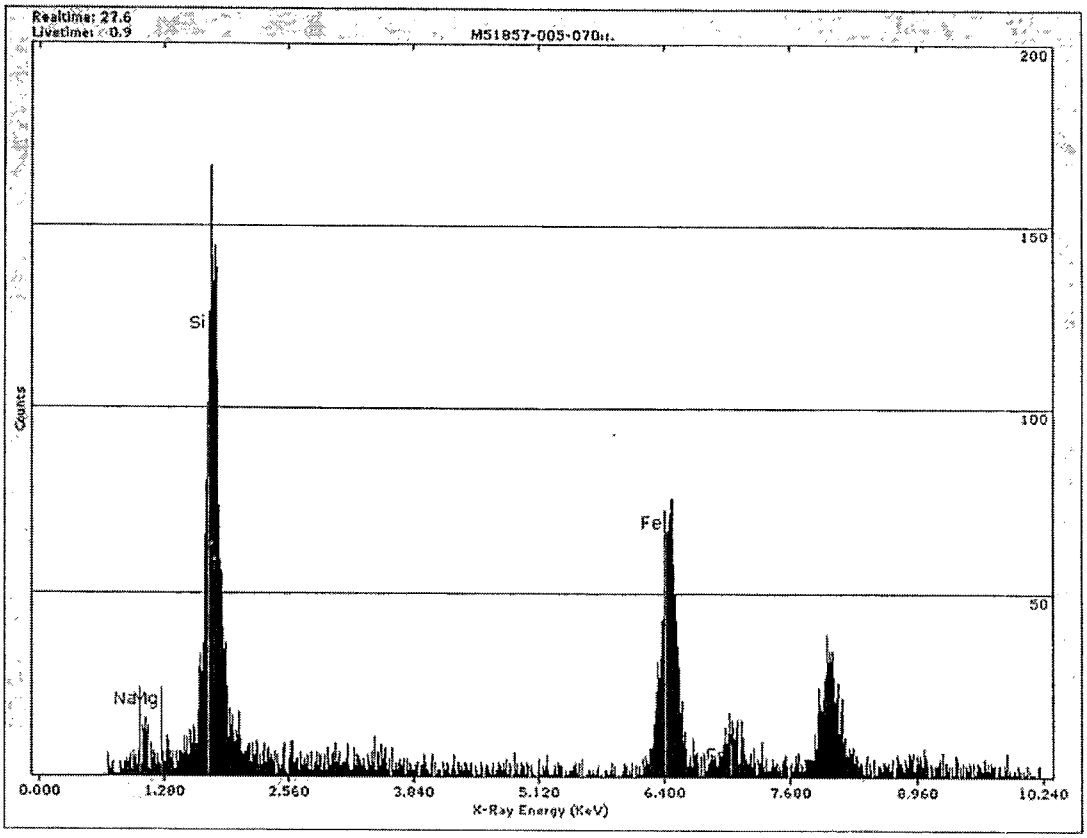

Realtime: 26.4
Livetime: 5.8
MS1857-005-020r.
444
333
222
111
Counts
Si
Fe
Na Mg
0.000
1.280
2.560
3.840
5.120
6.400
7.680
8.960
10.240
X-Ray Energy (KeV)

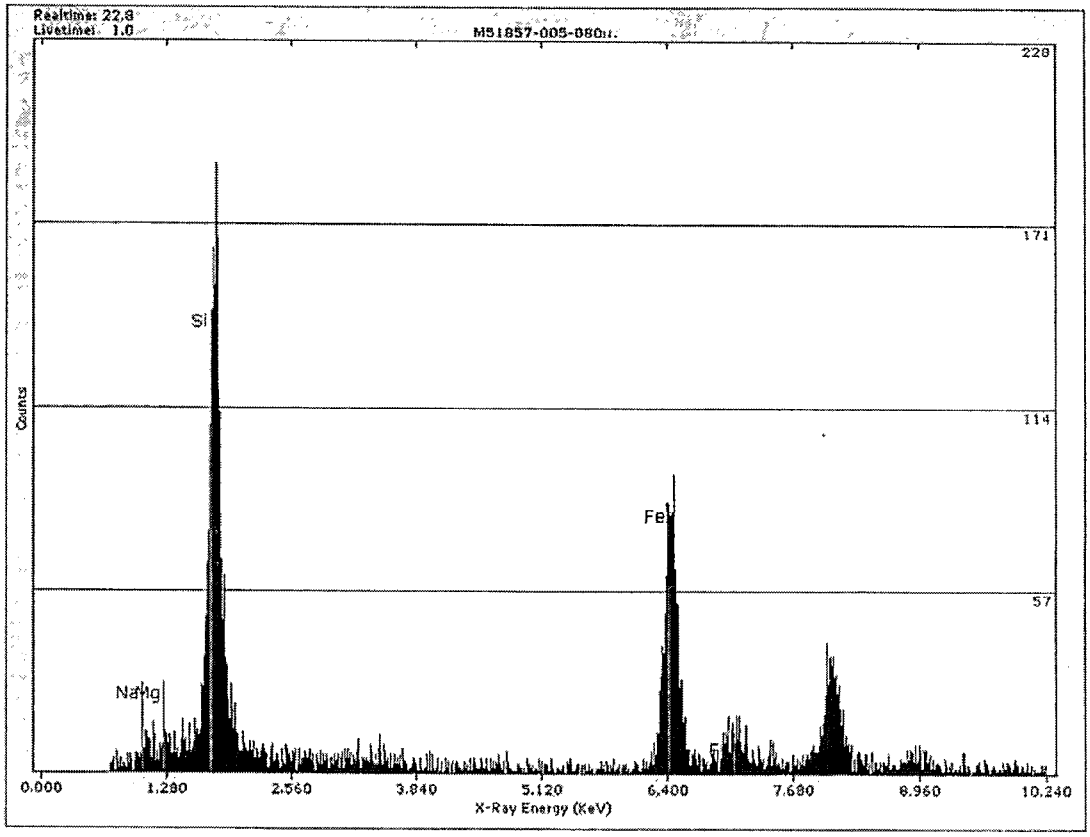

Realtime: 24.0
Livetime: 13.1
M51857-005-030.rf
Counts
618
463
309
154
Si
Mg
Na
Fe
0.000
1.280
2.560
3.840
5.120
6.400
7.680
8.960
10.240
X-Ray Energy (KeV)

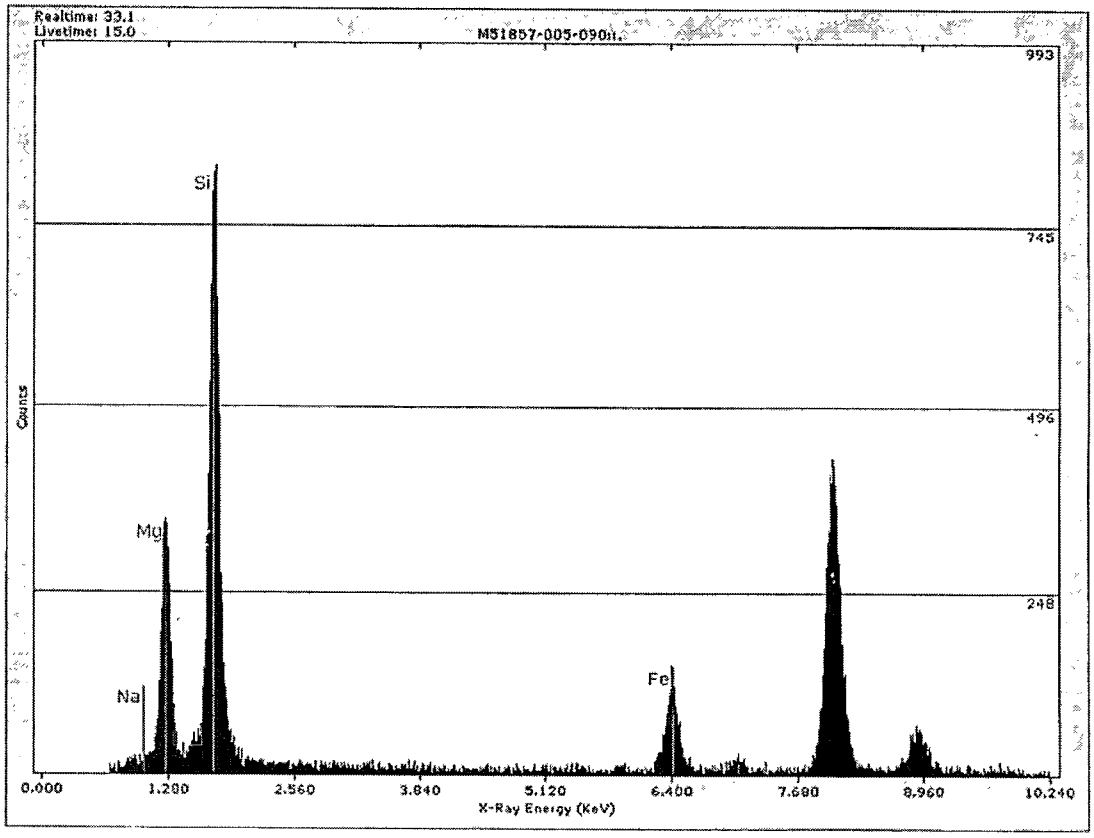

Realtime: 31.7
Livetime: 14.3
M51837-005-040m
750
562
375
187
Counts
Si
Fe
Fe
Na Mg
0.000
1.280
2.560
3.840
5.120
6.400
7.680
8.960
10.240
X-Ray Energy (KeV)

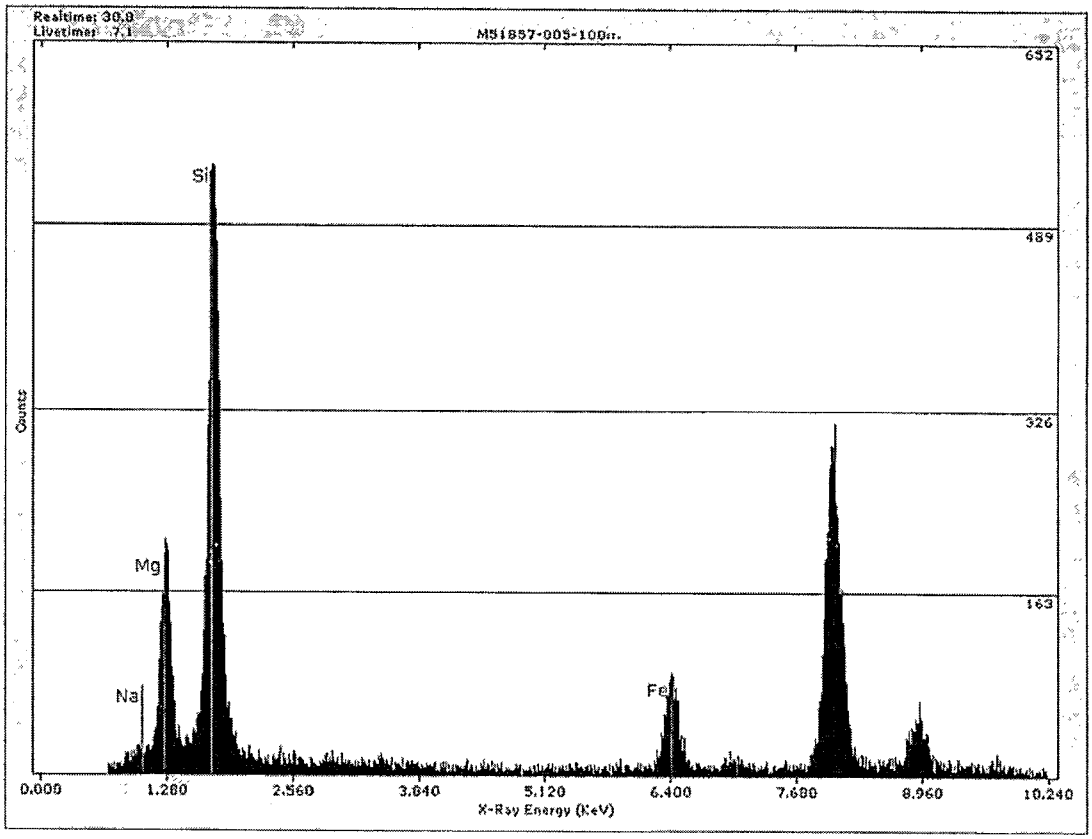

Realtime: 26.5
Livetime: 15.1
MS1857-005-050n.
567
425
283
141
Counts
Si
Mg
Na
Fe
0.000
1.280
2.560
3.840
5.120
6.400
7.680
8.960
10.240
X-Ray Energy (KeV)


Realtime: 22.7
Livetime: 9.6
M51857-005-060::
685
513
342
171
Counts
Si
Fe
Na Mg
0.000
1.280
2.560
3.840
5.120
6.400
7.680
8.960
10.240
X-Ray Energy (KeV)


Realtime: 27.6
Livetime: 0.9
M51857-005-070.rt.
200
150
100
50
Counts
Si
Fe
Na Mg
0.000
1.280
2.560
3.840
5.120
6.400
7.680
8.960
10.240
X-Ray Energy (KeV)


Realtime: 22.8
Livetime: 1.0
M51857-005-080.
228
171
114
57
Counts
Si
Fe
Na
Mg
0.000
1.280
2.560
3.840
5.120
6.400
7.680
8.960
10.240
X-Ray Energy (KeV)


Realtime: 33.1
Livetime: 15.0
M51857-005-090il
993
745
496
248
Counts
Si
Mg
Na
Fe
0.000
1.280
2.560
3.840
5.120
6.400
7.680
8.960
10.240
X-Ray Energy (KeV)


Realtime: 30.0
Livetime: 7.1
MS1857-005-100n.
652
489
326
163
Counts
Si
Mg
Na
Fe
0.000
1.280
2.560
3.840
5.120
6.400
7.680
8.960
10.240
X-Ray Energy (KeV)

SECTION 6

MAS, LLC.
PROJECT COC

MAS ID:	M51863	**Client Job No:**	
Client Name:	Materials Analytical Services Atlanta	**Client PO:**	
Project Name:	ECL AC Resin Pipe Cutting Electric Saw	**Date In:**	9/28/2010
Logged By:	ddmount	**Client Code:**	MASCORP

TRANSPORT INFORMATION:

Submitted By:	Michael Mount, CIH	**Documents:**	COC
Delivery By:	Hand Delivery		
Received By:	Nancy Sears	**Comments for COC:**	
Condition:	good		

CONTACT INFORMATION:

Contact: Bill Longo

Title:	**First Name:**	**Last Name:**	**Suffix**
Mr.	William	Longo	

Work Phone: (770) 866-3200 **Ext:**

Other Phone: **Ext:**

Fax: (770) 866-3259

SAMPLE INFORMATION:

#	Client ID	Volume	#	Client ID	Volume
000	lab blank	0			
001	A-03-A	540			
002	A-03-B	100			
003	A-03-C	540			
004	A-03-D	500			
005	P-3-A	2.4			
006	P-3-B	2.32			
007	P-3-C	2.44			
008	P-3-D	2.64			
009	A-3-A	8.16			
010	A-3-B	8.24			
011	A-3-C	8.2			
012	A-3-D	7.52			
013	A-3-E	900			
014	FB-3-1	0			
015	FB-3-2	0			

SIGNATURES

RECEIVED BY: _____

M 5100

Page 1 of 1

212 CFM
11:6°F
61.40% RH

INDUSTRIAL HYGIENE AIR SAMPLING CHAIN OF CUSTODY

MAS.

3945 Lakefield Court
Suwanee, GA 30024
Phone: 770-866-3200
Fax: 770-866-3259

COMPANY NAME: MAS, LLC, Dept 14
ADDRESS:
PHONE:
FAX:

PROJECT NUMBER:
PROJECT NAME: AC Resin Pipe Cutting, Electric Saw
WORK AREA DESCRIPTION: Study 3 - Carbide Blade
PROJECT REPRESENTATIVE: Mike Mount
SAMPLING DATE: 9/27/10

TURNAROUND TIMES: _____ 1 DAY _____ 3 DAYS _____ STANDARD 5 –7 DAYS

DATE	SAMPLE NUMBER	SAMPLE LOCATION	SAMPLE MEDIA	ANALYSIS DESIRED	START TIME	STOP TIME	TOTAL TIME MINUTES	PRE FLOW RATE LPM	POST FLOW RATE LPM	AVG. FLOW RATE LPM	Total Volume Liters
9/27	A-03-A	Background, NE	37mm MCE	7400, 7402	2:55	3:45	50	10.0	11.51	10.8	540
	B	SE		7402				2.0	2.0	2.0	100
	C	SW						10.0	11.6	10.8	540
	D	NW						10.1	9.9	10.0	500
	P-3-A	Personal, Pw Worker, R		7402	4:04	4:08	4	.66	.53	.60	2.40
	B	L		7402				.64	.52	.58	2.32
	C	R						.60	.62	.61	2.44
	D	L						.68	.64	.66	2.64
	A-3-A	Area, During Cut, NE		7402				2.06	2.02	2.04	8.16
	B	SE		7402				2.09	2.02	2.06	8.24
	C	SW						2.08	2.02	2.05	8.2
	D	NW						1.93	1.83	1.88	7.52
	E	Outside ECh			3:05	4:35	90	10.0	10.0	10	900
	FB-3-1	Field Blank,		7402							0
	2	MS18604		7402							0
	FAB-3-1	Fabric Shirt Before	Fabric								
	2	& AFTER									

CHAIN OF CUSTODY	NAME	COMPANY	MODE OF TRANSFER	LOG IN DATE	RECEIVED BY	COMPANY
First Transfer by:	Mike Dillard	Hand MAS LLC	Hand	9-28-10	Maryjeans	MAS
Second Transfer by:						
Third Transfer by:						

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

MAS Project: AC Resin Pipe Cutting Study 3 - Electric Saw, Carbide Blade MAS Sample #: M51863-001

Client Sample ID: A-03-A Analysis Date: 9/29/10

0	0	0	0	0	0	
0	0	0	0	0	0	10
0	0	0	0	0	0	
0	0	0	0	0	0	20
0	0	0	0	0	0	
1	1	0	0	0	0	30
0	0	0	0	0	0	
0	0	0	0	0	0	40
1	0	0	0	1	0	
1	0	1	0	0	0	50
2	0	0	0	0	2	
1	1	0	0	0	0	60
0.5	0	0	0.5	0	0	
1	1	0	0	0	0	70
0	0	0	0	0	0	
0	0	0	0	0	0	80
0	0	0	0	0	0	
2	1	0	0	0	1	90
2	0	0	2	0	0	
1	0	0	0	1	0	100
12.5	4	1	2.5	2	3	12.5

Pump Flow Rate, Liters/Minute (FR)	**10.8**
Sample Time, Minutes (T)	**50**
Total Sample Volume, Liters (V)	**540**
Total Fibers Counted, Sample (FCS)	**12.5**
Total Fields Counted, Samples (FLS)	100
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 15.9 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= < 0.011 fibers/cm^3

Notes:

Media Type: 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased.

Analyst: W. B. Egeland Date: 9/29/2010

Reviewed By: M. Mount Date: 10/4/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

MAS Project: AC Resin Pipe Cutting Study 3 - Electric Saw, Carbide Blade MAS Sample #: M518635-002

Client Sample ID: A-03-B Analysis Date: 9/29/10

0	0	0	0	0	0	
0	0	0	0	0	0	10
0	0	0	0	0	0	
0	0	0	0	0	0	20
0	0	0	0	0	0	
0	0	0	0	0	0	30
0	0	0	0	0	0	
0	0	0	0	0	0	40
1	0	0	1	0	0	
0	0	0	0	0	0	50
0	0	0	0	0	0	
0	0	0	0	0	0	60
0	0	0	0	0	0	
0	0	0	0	0	0	70
0	0	0	0	0	0	
0	0	0	0	0	0	80
0	0	0	0	0	0	
0	0	0	0	0	0	90
0	0	0	0	0	0	
0	0	0	0	0	0	100
1.0	0	0	1	0	0	1.0

Pump Flow Rate, Liters/Minute (FR)	2
Sample Time, Minutes (T)	50
Total Sample Volume, Liters (V)	100
Total Fibers Counted, Sample (FCS)	1.0
Total Fields Counted, Samples (FLS)	100
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 1.3 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= < 0.027 fibers/cm^3

Notes:

Media Type. 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased.

Analyst: W. B. Egeland Date: 9/29/2010

Reviewed By: M. Mount Date: 10/4/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

MAS Project: AC Resin Pipe Cutting Study 3 - Electric Saw, Carbide Blade MAS Sample #: M51863-003

Client Sample ID: A-03-C Analysis Date: 9/29/10

2	0	0	2	0	0	
0	0	0	0	0	0	10
0	0	0	0	0	0	
0	0	0	0	0	0	20
0	0	0	0	0	0	
2	0	1	1	0	0	30
3	1	0	0	1	1	
3	0	0	3	0	0	40
0.5	0	0	0	0	0.5	
0	0	0	0	0	0	50
1	0	1	0	0	0	
3	0	0	0	0	3	60
1	0	0	1	0	0	
0	0	0	0	0	0	70
0	0	0	0	0	0	
0	0	0	0	0	0	80
0	0	0	0	0	0	
0	0	0	0	0	0	90
0	0	0	0	0	0	
0	0	0	0	0	0	100
15.5	1	2	7	1	4.5	15.5

Pump Flow Rate, Liters/Minute (FR)	**10.8**
Sample Time, Minutes (T)	**50**
Total Sample Volume, Liters (V)	**540**
Total Fibers Counted, Sample (FCS)	**15.5**
Total Fields Counted, Samples (FLS)	100
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 19.7 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= 0.014 fibers/cm^3

Notes:

Media Type: 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased.

Analyst: W. B. Egeland Date: 9/29/2010

Reviewed By: M. Mount Date: 10/4/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

MAS Project: AC Resin Pipe Cutting Study 3 - Electric Saw, Carbide Blade MAS Sample #: M51863-004

Client Sample ID: A-03-D Analysis Date: 9/29/10

1	1	0	0	0	0	
0	0	0	0	0	0	10
0	0	0	0	0	0	
2	0	0	0	2	0	20
0	0	0	0	0	0	
2	0	0	1	0	1	30
1	0	1	0	0	0	
0	0	0	0	0	0	40
1	0	0	0	1	0	
0	0	0	0	0	0	50
0	0	0	0	0	0	
0	0	0	0	0	0	60
0	0	0	0	0	0	
0	0	0	0	0	0	70
0	0	0	0	0	0	
1	0	1	0	0	0	80
0	0	0	0	0	0	
0.5	0.5	0	0	0	0	90
0	0	0	0	0	0	
0	0	0	0	0	0	100
8.5	1.5	2	1	3	1	8.5

Pump Flow Rate, Liters/Minute (FR)	**10**
Sample Time, Minutes (T)	**50**
Total Sample Volume, Liters (V)	**500**
Total Fibers Counted, Sample (FCS)	**8.5**
Total Fields Counted, Samples (FLS)	100
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 10.8 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= 0.008 fibers/cm^3

Notes:

Media Type: 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased.

Analyst: W. B. Egeland Date: 9/29/2010

Reviewed By: M. Mount Date: 10/4/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

MAS Project: AC Resin Pipe Cutting Study 3 - Electric Saw, Carbide Blade MAS Sample #: M51863-005

Client Sample ID: P-3-A Analysis Date: 9/29/10

29	2.5	6	12	3	5.5	
21.5	4	5	5	5	2.5	10
19	5.5	5.5	1	6	1	
22	5.5	5	4	5	2.5	20
8.5	3.5	2	3			
0						30
0						
0						40
0						
0						50
0						
0						60
0						
0						70
0						
0						80
0						
0						90
0						
0						100
100.0	21	23.5	25	19	11.5	100.0

Pump Flow Rate, Liters/Minute (FR)	**0.6**
Sample Time, Minutes (T)	4
Total Sample Volume, Liters (V)	**2.4**
Total Fibers Counted, Sample (FCS)	**100**
Total Fields Counted, Samples (FLS)	23
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 553.9 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= 88.8 fibers/cm^3

Notes:

Media Type: 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal vanability and are probably biased.

Analyst: W. B. Egeland Date: 9/29/2010

Reviewed By: M. Mount Date: 10/4/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

MAS Project: AC Resin Pipe Cutting Study 3 - Electric Saw, Carbide Blade MAS Sample #: M51863-006

Client Sample ID: P-3-B Analysis Date: 9/29/10

28.5	7	7	6	5.5	3	
32.5	8.5	5	8	7	4	10
41	6	11.5	7	8.5	8	
28.5	6	7	3.5	6	6	20
0						
0						30
0						
0						40
0						
0						50
0						
0						60
0						
0						70
0						
0						80
0						
0						90
0						
0						100
130.5	27.5	30.5	24.5	27	21	130.5

Pump Flow Rate, Liters/Minute (FR)	**0.58**
Sample Time, Minutes (T)	**4**
Total Sample Volume, Liters (V)	**2.3**
Total Fibers Counted, Sample (FCS)	**130.5**
Total Fields Counted, Samples (FLS)	20
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 831.2 **fibers/mm^2**

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= 137.9 **fibers/cm^3**

Notes:

Media Type: 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased.

Analyst: W. B. Egeland Date: 9/29/2010

Reviewed By: M. Mount Date: 10/4/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

MAS Project: AC Resin Pipe Cutting Study 3 - Electric Saw, Carbide Blade MAS Sample #: M51863-007

Client Sample ID: P-3-C Analysis Date: 9/29/10

36.5	7	8	4	14	3.5	
37.5	8	7.5	7	6	9	10
33.5	5	4	13.5	6	5	
40.5	11	6	2	14.5	7	20
0						
0						30
0						
0						40
0						
0						50
0						
0						60
0						
0						70
0						
0						80
0						
0						90
0						
0						100
148.0	31	25.5	26.5	40.5	24.5	148.0

Pump Flow Rate, Liters/Minute (FR)	**0.61**
Sample Time, Minutes (T)	**4**
Total Sample Volume, Liters (V)	**2.44**
Total Fibers Counted, Sample (FCS)	**148**
Total Fields Counted, Samples (FLS)	20
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	30
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 942.7 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= 148.7 fibers/cm^3

Notes:

Media Type: 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased.

Analyst: W. B. Egeland Date: 9/29/2010

Reviewed By: M. Mount Date: 10/4/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

MAS Project: AC Resin Pipe Cutting Study 3 - Electric Saw, Carbide Blade MAS Sample #: M51863-008

Client Sample ID: P-3-D Analysis Date: 9/29/10

15	2	1.5	9.5	2	0	
22	2	2	8	3	7	10
13.5	3	5	0	2	3.5	
15.5	6.5	2.5	3	3	0.5	20
9.5	2	1	4.5	2	0	
6.5	1	0	2.5	3	0	30
17.5	3	2	2.5	8	2	
2.5	2.5					40
0						
0						50
0						
0						60
0						
0						70
0						
0						80
0						
0						90
0						
0						100
102.0	22	14	30	23	13	102.0

Pump Flow Rate, Liters/Minute (FR)	**0.66**
Sample Time, Minutes (T)	**4**
Total Sample Volume, Liters (V)	**2.64**
Total Fibers Counted, Sample (FCS)	**102**
Total Fields Counted, Samples (FLS)	36
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 360.9 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= 52.6 fibers/cm^3

Notes.

Media Type: 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased

Analyst: W. B. Egeland Date: 9/29/2010

Reviewed By: M. Mount Date: 10/4/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

MAS Project: AC Resin Pipe Cutting Study 3 - Electric Saw, Carbide Blade MAS Sample #: M51863-009

Client Sample ID: A-3-A Analysis Date: 9/29/10

57	15	14	15.5	7.5	5	
68.5	10	17.5	12.5	10	18.5	10
77	17.5	17.5	10.5	14.5	17	
72	13.5	14.5	11.5	16	16.5	20
0						
0						30
0						
0						40
0						
0						50
0						
0						60
0						
0						70
0						
0						80
0						
0						90
0						
0						100
274.5	56	63.5	50	48	57	274.5

Pump Flow Rate, Liters/Minute (FR)	**2.04**
Sample Time, Minutes (T)	**4**
Total Sample Volume, Liters (V)	**8.16**
Total Fibers Counted, Sample (FCS)	**274.5**
Total Fields Counted, Samples (FLS)	20
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 1748.4 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= 82.5 fibers/cm^3

Notes:

Media Type: 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased.

Analyst: W. B. Egeland Date: 9/29/2010

Reviewed By: M. Mount Date: 10/4/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

MAS Project: AC Resin Pipe Cutting Study 3 - Electric Saw, Carbide Blade MAS Sample #: M51863-010

Client Sample ID: A-3-B Analysis Date: 9/29/10

44.5	7.5	9	6.5	10	11.5	
60.5	8.5	7	8	17	20	10
56.5	13	9.5	9.5	8	16.5	
45	9	11.5	6	14	4.5	20
0						
0						30
0						
0						40
0						
0						50
0						
0						60
0						
0						70
0						
0						80
0						
0						90
0						
0						100
206.5	38	37	30	49	52.5	206.5

Pump Flow Rate, Liters/Minute (FR)	2.06
Sample Time, Minutes (T)	4
Total Sample Volume, Liters (V)	8.24
Total Fibers Counted, Sample (FCS)	206.5
Total Fields Counted, Samples (FLS)	20
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 1315.3 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= 61.5 fibers/cm^3

Notes:

Media Type: 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased.

Analyst: W. B. Egeland Date: 9/29/2010

Reviewed By: M. Mount Date: 10/4/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

MAS Project: AC Resin Pipe Cutting Study 3 - Electric Saw, Carbide Blade MAS Sample #: M51863-011

Client Sample ID: A-3-C Analysis Date: 9/29/10

68.5	16	15	20	7	10.5	
81.5	11.5	19.5	15.5	18.5	16.5	10
81	19.5	17.5	15	17.5	11.5	
71	13.5	19	17.5	11.5	9.5	20
0						
0						30
0						
0						40
0						
0						50
0						
0						60
0						
0						70
0						
0						80
0						
0						90
0						
0						100
302.0	60.5	71	68	54.5	48	302.0

Pump Flow Rate, Liters/Minute (FR)	2.05
Sample Time, Minutes (T)	4
Total Sample Volume, Liters (V)	8.2
Total Fibers Counted, Sample (FCS)	302
Total Fields Counted, Samples (FLS)	20
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 1923.6 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= 90.3 fibers/cm^3

Notes:

Media Type: 25 mm MCE Filter

Limit of Quantitation (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased.

Analyst: W. B. Egeland Date: 9/29/2010

Reviewed By: M. Mount Date: 10/4/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

MAS Project: AC Resin Pipe Cutting Study 3 - Electric Saw, Carbide Blade MAS Sample #: M51863-012

Client Sample ID: A-3-D Analysis Date: 9/29/10

62.5	18.5	6	17	14.5	6.5	
60	12	19.5	10	6	12.5	10
64	10.5	15.5	12	8	18	
65	16.5	8.5	18	10.5	11.5	20
0						
0						30
0						
0						40
0						
0						50
0						
0						60
0						
0						70
0						
0						80
0						
0						90
0						
0						100
251.5	57.5	49.5	57	39	48.5	251.5

Pump Flow Rate, Liters/Minute (FR)	1.88
Sample Time, Minutes (T)	4
Total Sample Volume, Liters (V)	7.52
Total Fibers Counted, Sample (FCS)	251.5
Total Fields Counted, Samples (FLS)	20
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 1601.9 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= 82.0 fibers/cm^3

Notes:

Media Type: 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased.

Analyst: W. B. Egeland Date: 9/29/2010

Reviewed By: M. Mount Date: 10/4/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

MAS Project: AC Resin Pipe Cutting Study 3 - Electric Saw, Carbide Blade MAS Sample #: M51863-013

Client Sample ID: A-3-E Analysis Date: 9/29/10

0.5	0	0.5	0	0	0	
0	0	0	0	0	0	10
1	0	0	1	0	0	
0	0	0	0	0	0	20
0	0	0	0	0	0	
0	0	0	0	0	0	30
0	0	0	0	0	0	
2	2	0	0	0	0	40
0	0	0	0	0	0	
0	0	0	0	0	0	50
1.5	0	0	1	0	0.5	
0.5	0	0	0.5	0	0	60
0	0	0	0	0	0	
1	1	0	0	0	0	70
0	0	0	0	0	0	
0	0	0	0	0	0	80
1	0	0	0	1	0	
1	0	0	0	1	0	90
0.5	0	0.5	0	0	0	
1	0	0	1	0	0	100
10.0	3	1	3.5	2	0.5	10.0

Pump Flow Rate, Liters/Minute (FR)	10
Sample Time, Minutes (T)	90
Total Sample Volume, Liters (V)	900
Total Fibers Counted, Sample (FCS)	10
Total Fields Counted, Samples (FLS)	100
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= 12.7 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= 0.005 fibers/cm^3

Notes:

Media Type: 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased.

Analyst: W. B. Egeland Date: 9/29/2010

Reviewed By: M. Mount Date: 10/4/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

MAS Project: AC Resin Pipe Cutting Study 3 - Electric Saw, Carbide Blade MAS Sample #: M51863-014

Client Sample ID: FB-3-1 Analysis Date: 9/29/10

0	0	0	0	0	0	
0	0	0	0	0	0	10
0	0	0	0	0	0	
0	0	0	0	0	0	20
0	0	0	0	0	0	
0	0	0	0	0	0	30
0	0	0	0	0	0	
0	0	0	0	0	0	40
0	0	0	0	0	0	
0	0	0	0	0	0	50
0	0	0	0	0	0	
0	0	0	0	0	0	60
0	0	0	0	0	0	
0	0	0	0	0	0	70
0	0	0	0	0	0	
0	0	0	0	0	0	80
0	0	0	0	0	0	
0	0	0	0	0	0	90
0	0	0	0	0	0	
0	0	0	0	0	0	100
0.0	0	0	0	0	0	0.0

Pump Flow Rate, Liters/Minute (FR) 0

Sample Time, Minutes (T) 0

Total Sample Volume, Liters (V) 0

Total Fibers Counted, Sample (FCS) 0

Total Fields Counted, Samples (FLS) 100

Total Fibers Counted, Blank (FCB) 0

Total Fields Counted, Blank(FLB) 100

Area of Filter, mm^2 (AF) 385

Graticule Field Area, MM^2 (GFA) 0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= < 7.0 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= NA fibers/cm^3

Notes:

Media Type. 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal vanability and are probably biased

Analyst: W. B. Egeland Date: 9/29/2010

Reviewed By: M. Mount Date: 10/4/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

MAS Project: AC Resin Pipe Cutting Study 3 - Electric Saw, Carbide Blade MAS Sample #: M51863-015

Client Sample ID: FB-3-2 Analysis Date: 9/29/10

0	0	0	0	0	0		
0	0	0	0	0	0	10	
0	0	0	0	0	0		
0	0	0	0	0	0	20	
0	0	0	0	0	0		
0	0	0	0	0	0	30	
0	0	0	0	0	0		
0	0	0	0	0	0	40	
0	0	0	0	0	0		
0	0	0	0	0	0	50	
0	0	0	0	0	0		
0	0	0	0	0	0	60	
0	0	0	0	0	0		
0	0	0	0	0	0	70	
0	0	0	0	0	0		
0	0	0	0	0	0	80	
0	0	0	0	0	0		
0	0	0	0	0	0	90	
0	0	0	0	0	0		
0	0	0	0	0	0	100	
0.0	0	0	0	0	0	0.0	

Pump Flow Rate, Liters/Minute (FR)	0
Sample Time, Minutes (T)	0
Total Sample Volume, Liters (V)	0
Total Fibers Counted, Sample (FCS)	0
Total Fields Counted, Samples (FLS)	100
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= < 7.0 **fibers/mm^2**

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= NA **fibers/cm^3**

Notes:

Media Type: 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased.

Analyst: W. B. Egeland Date: 9/29/2010

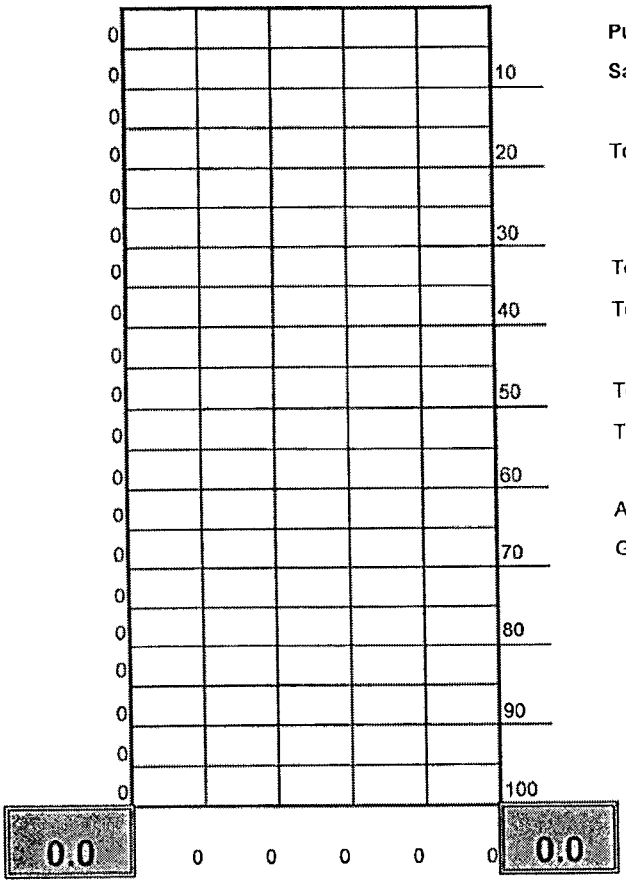
Reviewed By: M. Mount Date: 10/4/2010

Materials Analytical Services

Airborne Fiber Analysis-NIOSH 7400 Issue 2, PCM

MAS Project: AC Resin Pipe Cutting Study 3 - Electric Saw, Carbide Blade MAS Sample #: M51863-

Client Sample ID: _____ Analysis Date:



Pump Flow Rate, Liters/Minute (FR)	0
Sample Time, Minutes (T)	0
Total Sample Volume, Liters (V)	0
Total Fibers Counted, Sample (FCS)	0
Total Fields Counted, Samples (FLS)	100
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank(FLB)	100
Area of Filter, mm^2 (AF)	385
Graticule Field Area, MM^2 (GFA)	0.00785

Calc. of Fiber Density (E) in Fibers/ mm^2

E= < 7.0 fibers/mm^2

Calc. of Fiber Conc.(C) in Fibers/cm^3

C= < #DIV/0! fibers/cm^3

Notes: _____

Media Type: 25 mm MCE Filter

Limit of Quantition (LOQ) = 7 fibers/mm^2

Fiber counts outside the 100-1300 fibers/mm^2 range have greater than optimal variability and are probably biased

Analyst: W. B. Egeland Date: _____

Reviewed By: M. Mount Date: _____

M 51863

Page 1 of 1

~ CFM
71.6°F
61.4% RH

INDUSTRIAL HYGIENE AIR SAMPLING CHAIN OF CUSTODY

MAS

3945 Lakefield Court
Suwanee, GA 30024
Phone: 770-866-3200
Fax: 770-866-3259

COMPANY NAME: MAS, LLC, Dept 14
ADDRESS:
PHONE:
FAX:

PROJECT NUMBER:
PROJECT NAME: PR; Pipe Cutting, Electric Saw
WORK AREA DESCRIPTION: Study 3 - Carbide Blade
PROJECT REPRESENTATIVE: Mike Meesit
SAMPLING DATE: 9/27/10

TURNAROUND TIMES: _____ 1 DAY _____ 3 DAYS _____ STANDARD 5 –7 DAYS

DATE	SAMPLE NUMBER	SAMPLE LOCATION	SAMPLE MEDIA	ANALYSIS DESIRED	START TIME	STOP TIME	TOTAL TIME MINUTES	PRE FLOW RATE LPM	POST FLOW RATE LPM	AVG. FLOW RATE LPM	Total Volume Liters
9/27	A-03-A	Background, NE	8um MCE	7400, 7402	2:55	3:45	50	10.0	11.51	10.8	540
	B	SE		7402				2.0	2.0	2.0	100
	C	SW						10.0	11.6	10.8	540
	D	NW						10.1	9.9	10.0	500
	P-3-A	Personal, Dr Worker, R		7402	4:04	4:08	4	.66	.53	.60	2.40
	B	L		7402				.64	.52	.58	2.32
	C	R						.60	.62	.61	2.44
	D	L						.68	.64	.666	2.64
	A-3-A	Area, during Cut, NE		7402				2.06	2.02	2.04	8.16
	B	SE		7402				2.09	2.02	2.06	8.24
	C	SW						2.08	2.02	2.05	8.2
	D	NW						1.93	1.83	1.88	~~7.52~~
	E	Outside ECh			3:05	4:35	90	10.0	10.0	10	900
	EB-3-1	Field Blank,		7402							0
	2	M51864		7402							0
	FAB-3-1	Fabric Shirt Before	Fabric								
	2	& AFTER									

CHAIN OF CUSTODY	NAME	COMPANY	MODE OF TRANSFER	LOG IN DATE	RECEIVED BY	COMPANY
First Transfer by:	[illegible]	Hand MAS LLC	Hand	9-28-10	[illegible]	MAS
Second Transfer by:						
Third Transfer by:						

M 51863

Page 1 of 1

2 :FM
71.6°F
61.40% RH

INDUSTRIAL HYGIENE AIR SAMPLING CHAIN OF CUSTODY

MAS

3945 Lakefield Court
Suwanee, GA 30024
Phone: 770-866-3200
Fax: 770-866-3259

COMPANY NAME: MAS, LLC, Dept 14
ADDRESS:
PHONE:
FAX:

PROJECT NUMBER:
PROJECT NAME: PR; Pipe Cutting, Electric Saw
WORK AREA DESCRIPTION: Study 3 - Carbide Blade
PROJECT REPRESENTATIVE: Mike Mount
SAMPLING DATE: 9/27/10

TURNAROUND TIMES: _____ 1 DAY _____ 3 DAYS _____ STANDARD 5 –7 DAYS

DATE	SAMPLE NUMBER	SAMPLE LOCATION	SAMPLE MEDIA	ANALYSIS DESIRED	START TIME	STOP TIME	TOTAL TIME MINUTES	PRE FLOW RATE LPM	POST FLOW RATE LPM	AVG. FLOW RATE LPM	Total Volume Liters
9/27	A-03-A	Background, NE	8um MCE	7400, 7402	2:55	3:45	50	10.0	11.51	10.8	540
	B	SE		7402				2.0	2.0	2.0	100
	C	SW						10.0	11.6	10.8	540
	D	NW						10.1	9.9	10.0	500
	P-3-A	Personal, Dr Worker, R		7402	4:04	4:08	4	.66	.53	.60	2,40
	B	L		7402				.64	.52	.58	2,32
	C	R						.60	.62	.61	2,44
	D	L						.68	.64	.66	2.64
	A-3-A	Area, during Cut, NE		7402				2.06	2.02	2.04	8.16
	B	SE		7402				2.09	2.02	2.06	8.24
	C	SW						2.08	2.02	2.05	8.2
	D	NW						1.93	1.83	1.88	24 7.52
	E	Outside ECh			3:05	4:35	90	10.0	10.0	10	900
	EB-3-1	Field Blank,		7402							0
	2	m51864		7402							0
	FAB-3-1	Fabric Shirt Before	Fabric								
	2	AFTER									

CHAIN OF CUSTODY	NAME	COMPANY	MODE OF TRANSFER	LOG IN DATE	RECEIVED BY	COMPANY
First Transfer by:	Mike Dillard	Hand MAS LLC	Hand	9-28-10	Maryjean	MAS
Second Transfer by:						
Third Transfer by:						

MAS TEM ANALYSIS

M51863-005

CLIENT NAME: Materials Analytical Services Atlanta | CLIENT SAMPLE ID: P-3-A

7402 ANALYSIS

Sample Area/ Volume:	2.4 Liters		Date Analyzed:	10/1/2010	
Filter Type:	MCE 25mm		Analyst:	A.Keeton	
Pore size:	0.8		Scope Number:	2	
Effective Filter Area:	385		Accelerating Voltage:	100	KV
Sample type:	Air		Indicated Mag:	25	KX
Analysis type:	7402		Screen Mag:	20	KX
Grid Acceptance	YES	5 %	Grid_box:	7710	

Number of grids:	3	#1:	110	#3:	110	Asbestos	102
Number of openings:	14	#2:	110	#4:	110	Non-asbestos	0

Average Grid Size: 0.012100 Total Area Analyzed: 0.169

% Asbestos 100

Str#:	SquareID.	Fiber Type	Size		Morph:	SAED	EDS
1	A5-A2	Anthophylite	16.2	1.1	Amphibole	Amphibole	✓
2		Anthophylite	21.4	0.6	Amphibole	Amphibole	✓
3		Crocidolite	8.7	0.6	Amphibole	Amphibole	✓
4		Anthophylite	13.5	0.5	Amphibole	Amphibole	✓
5		Anthophylite	14.8	0.4	Amphibole	Amphibole	✓
6		Anthophylite	6.5	0.6	Amphibole	Amphibole	✓
7	A3	Anthophylite	7.2	1.1	Amphibole	Amphibole	✓
8		Anthophylite	14	2	Amphibole	Amphibole	✓
9		Anthophylite	7.1	1	Amphibole	Amphibole	✓
10		Anthophylite	9	1.2	Amphibole	Amphibole	✓
11		Anthophylite	13	0.4	Amphibole	Amphibole	✓
12		Crocidolite	5.8	0.3	Amphibole	Amphibole	✓
13		Anthophylite	14	1.5	Amphibole	Amphibole	✓
14		Anthophylite	14.1	0.4	Amphibole	Amphibole	
15	B10	Anthophylite	6.2	0.8	Amphibole	Amphibole	
16		Anthophylite	8.5	0.5	Amphibole	Amphibole	
17		Crocidolite	7	0 45	Amphibole	Amphibole	
18		Anthophylite	8	0.5	Amphibole	Amphibole	
19		Crocidolite	12.1	0.3	Amphibole	Amphibole	
20		Anthophylite	14	0.5	Amphibole	Amphibole	✓
21		Crocidolite	7.1	0.4	Amphibole	Amphibole	
22	D2	Crocidolite	8.5	0.3	Amphibole	Amphibole	
23		Anthophylite	22 5	0 4	Amphibole	Amphibole	
24		Anthophylite	5.1	0.6	Amphibole	Amphibole	
25		Crocidolite	17.1	0.8	Amphibole	Amphibole	
26		Anthophylite	18	2	Amphibole	Amphibole	
27		Anthophylite	6 7	0.4	Amphibole	Amphibole	
28		Crocidolite	23.1	1.5	Amphibole	Amphibole	

29			Anthophylite	10.2	0.5	Amphibole	Amphibole	
30			Anthophylite	9	0.5	Amphibole	Amphibole	☑
31			Anthophylite	6 8	0.4	Amphibole	Amphibole	
32			Crocidolite	11.3	0.3	Amphibole	Amphibole	
33			Anthophylite	8.5	0.5	Amphibole	Amphibole	
34			Anthophylite	5.8	0.3	Amphibole	Amphibole	
35			Anthophylite	15.5	2.2	Amphibole	Amphibole	
36			Anthophylite	20.8	0.6	Amphibole	Amphibole	
37			Anthophylite	13	2	Amphibole	Amphibole	
38			Anthophylite	13.5	0.3	Amphibole	Amphibole	
39			Crocidolite	13.3	0.6	Amphibole	Amphibole	
40	D4		Anthophylite	7	0.6	Amphibole	Amphibole	☑
41			Crocidolite	10.1	0.4	Amphibole	Amphibole	
42			Crocidolite	85.5	2	Amphibole	Amphibole	
43			Anthophylite	48.6	2	Amphibole	Amphibole	
44			Anthophylite	7	0.5	Amphibole	Amphibole	
45			Crocidolite	13.5	0.5	Amphibole	Amphibole	
46			Crocidolite	18 5	0.4	Amphibole	Amphibole	
47	G2		Crocidolite	22.5	2.7	Amphibole	Amphibole	
48			Crocidolite	10.2	0.3	Amphibole	Amphibole	
49			Crocidolite	5.1	0.4	Amphibole	Amphibole	
50			Crocidolite	31.8	0.3	Amphibole	Amphibole	☑
51	G10		Anthophylite	23	1.5	Amphibole	Amphibole	
52			Crocidolite	17 1	0.3	Amphibole	Amphibole	
53			Crocidolite	35.1	0.5	Amphibole	Amphibole	
54			Anthophylite	5 5	0.6	Amphibole	Amphibole	
55			Crocidolite	17.3	2	Amphibole	Amphibole	
56			Crocidolite	35.1	0.6	Amphibole	Amphibole	
57			Anthophylite	9	0.4	Amphibole	Amphibole	
58			Crocidolite	11.8	0 6	Amphibole	Amphibole	
59	A6-A3		Anthophylite	16.3	1.5	Amphibole	Amphibole	
60			Crocidolite	9	0.3	Amphibole	Amphibole	☑
61			Crocidolite	5.3	0.3	Amphibole	Amphibole	
62			Anthophylite	11 8	0.4	Amphibole	Amphibole	
63			Anthophylite	6.7	0.3	Amphibole	Amphibole	
64	A4		Anthophylite	9	0.3	Amphibole	Amphibole	
65			Anthophylite	7	0.4	Amphibole	Amphibole	
66			Anthophylite	5.8	0.5	Amphibole	Amphibole	
67	C3		Anthophylite	9	0.4	Amphibole	Amphibole	
68			Anthophylite	13.5	1.1	Amphibole	Amphibole	
69			Crocidolite	13	1 8	Amphibole	Amphibole	
70			Crocidolite	5 1	0.3	Amphibole	Amphibole	☑
71			Anthophylite	11.2	0.5	Amphibole	Amphibole	
72			Anthophylite	7	1	Amphibole	Amphibole	
73			Anthophylite	7	1.1	Amphibole	Amphibole	
74			Anthophylite	7.5	1.1	Amphibole	Amphibole	
75	D8		Anthophylite	6.3	0.3	Amphibole	Amphibole	
76			Anthophylite	30 6	1	Amphibole	Amphibole	
77			Anthophylite	10 8	0.8	Amphibole	Amphibole	
78			Anthophylite	6.5	0.8	Amphibole	Amphibole	
79			Anthophylite	18.6	0 5	Amphibole	Amphibole	
80			Crocidolite	14.8	0.8	Amphibole	Amphibole	☑
81	F2		Crocidolite	6.9	0.3	Amphibole	Amphibole	
82			Anthophylite	9	1	Amphibole	Amphibole	

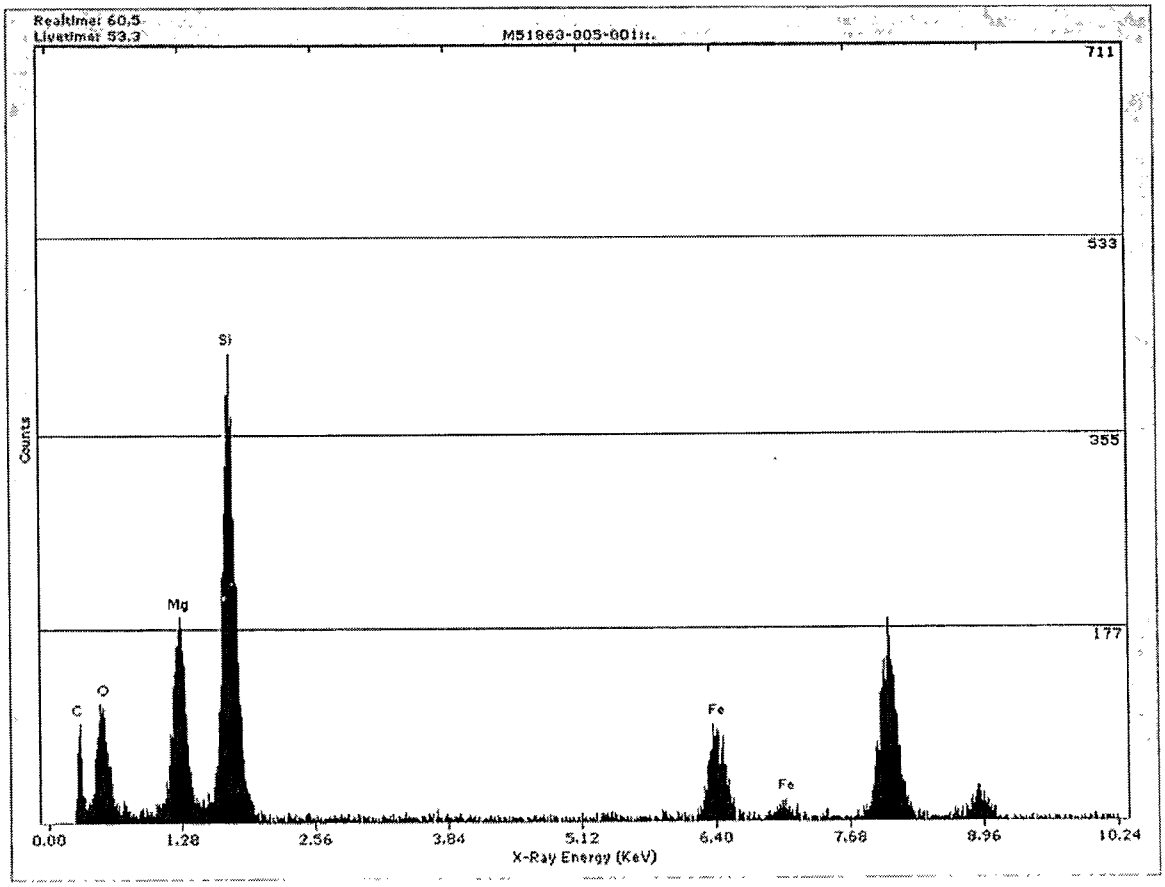
83			Anthophylite	6.7	0.8	Amphibole	Amphibole	
84			Anthophylite	10.6	0.8	Amphibole	Amphibole	
85	A7-D6		Anthophylite	29.3	1	Amphibole	Amphibole	
86			Anthophylite	22.6	0.6	Amphibole	Amphibole	
87			Crocidolite	7.5	0.3	Amphibole	Amphibole	
88			Anthophylite	10.3	0.8	Amphibole	Amphibole	
89			Crocidolite	16.1	0.4	Amphibole	Amphibole	
90			Anthophylite	18	1	Amphibole	Amphibole	✓
91			Anthophylite	6.5	1.1	Amphibole	Amphibole	
92			Anthophylite	6.8	0.3	Amphibole	Amphibole	
93			Anthophylite	7	0.3	Amphibole	Amphibole	
94	F7		Anthophylite	6.9	0.5	Amphibole	Amphibole	
95			Anthophylite	7.1	1.1	Amphibole	Amphibole	
96			Crocidolite	13	0.4	Amphibole	Amphibole	
97			Anthophylite	9.3	0.4	Amphibole	Amphibole	
98			Crocidolite	9	0.3	Amphibole	Amphibole	
99			Crocidolite	72	1.8	Amphibole	Amphibole	
100			Anthophylite	13.8	0.4	Amphibole	Amphibole	✓
101			Crocidolite	8.5	0.4	Amphibole	Amphibole	
102			Crocidolite	17.1	0.3	Amphibole	Amphibole	

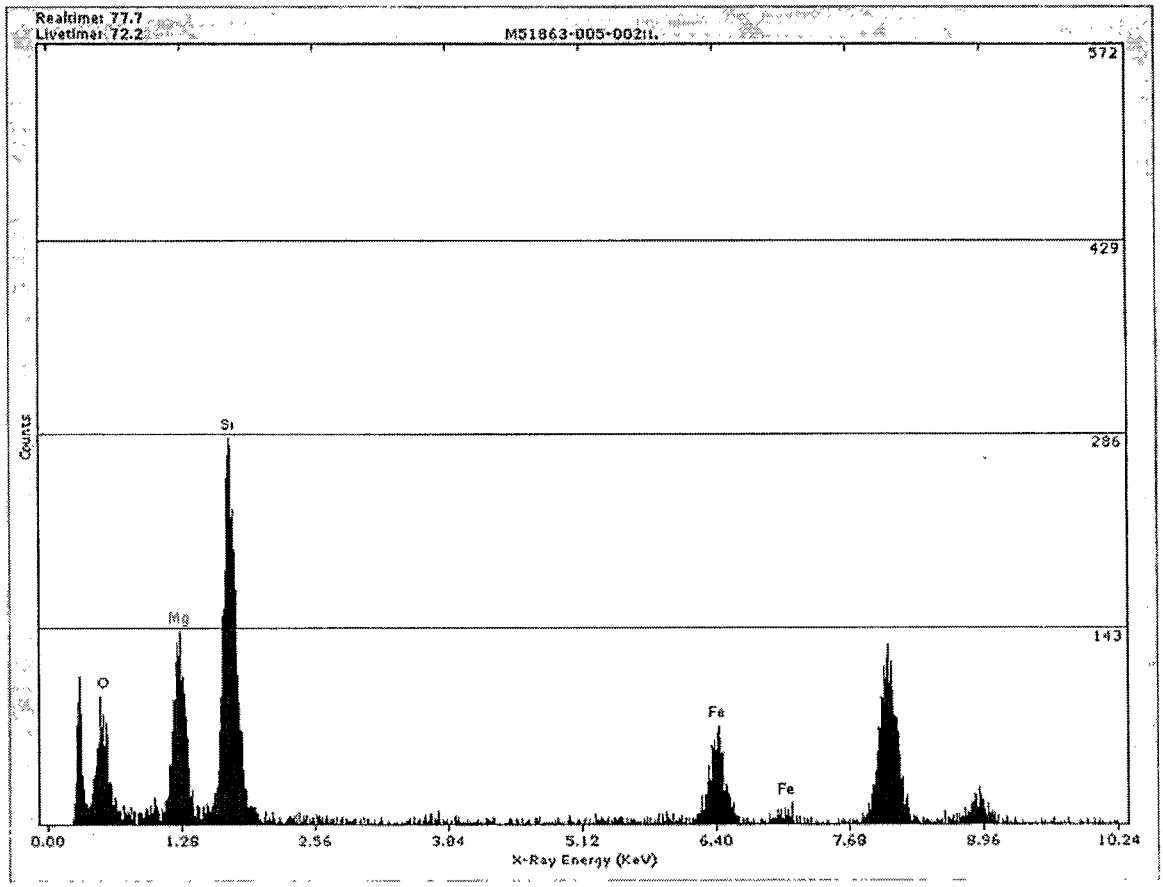
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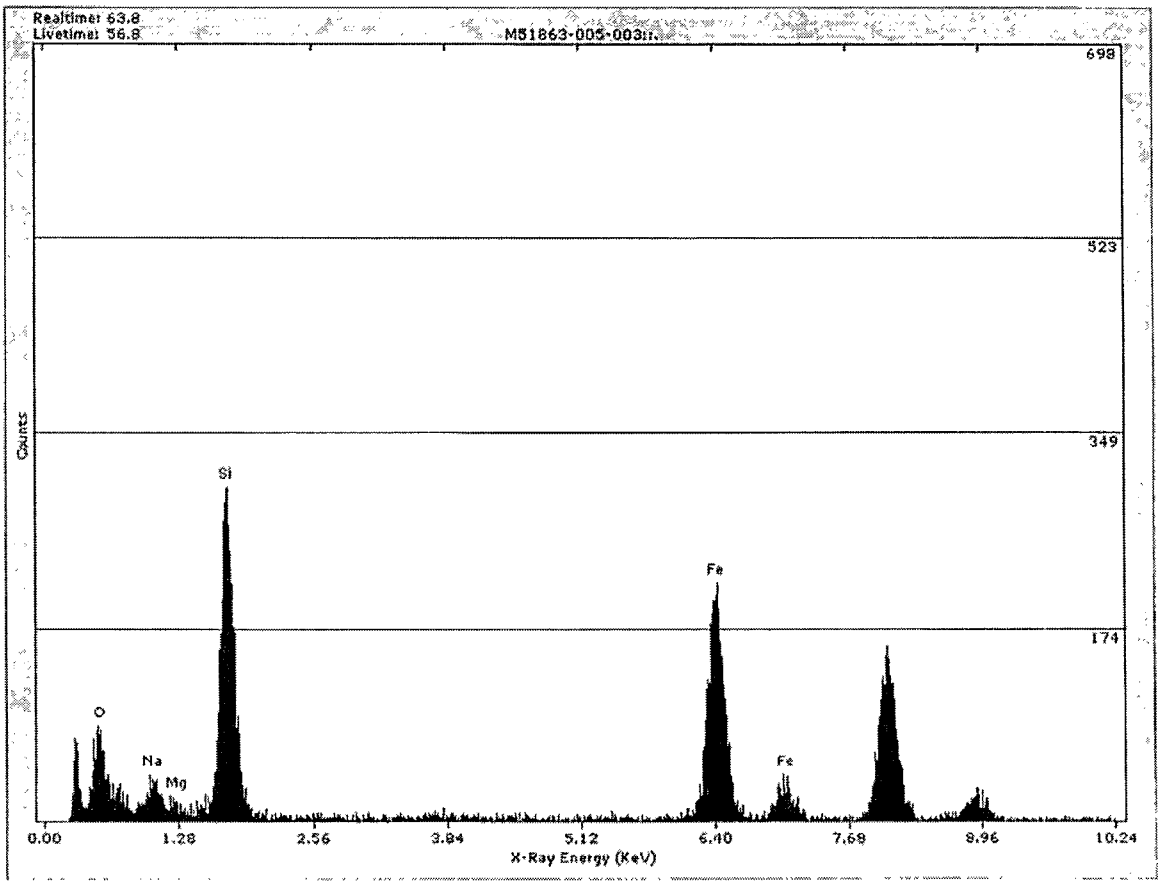
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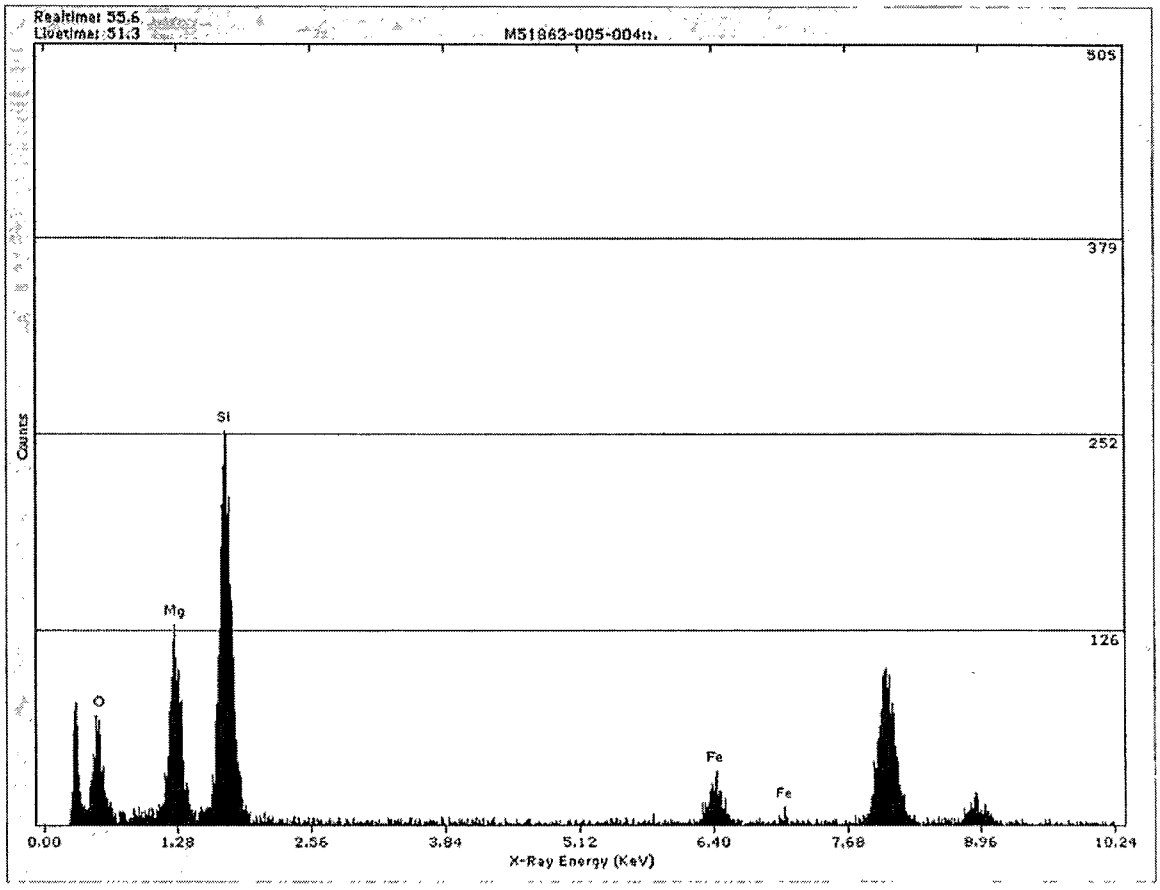
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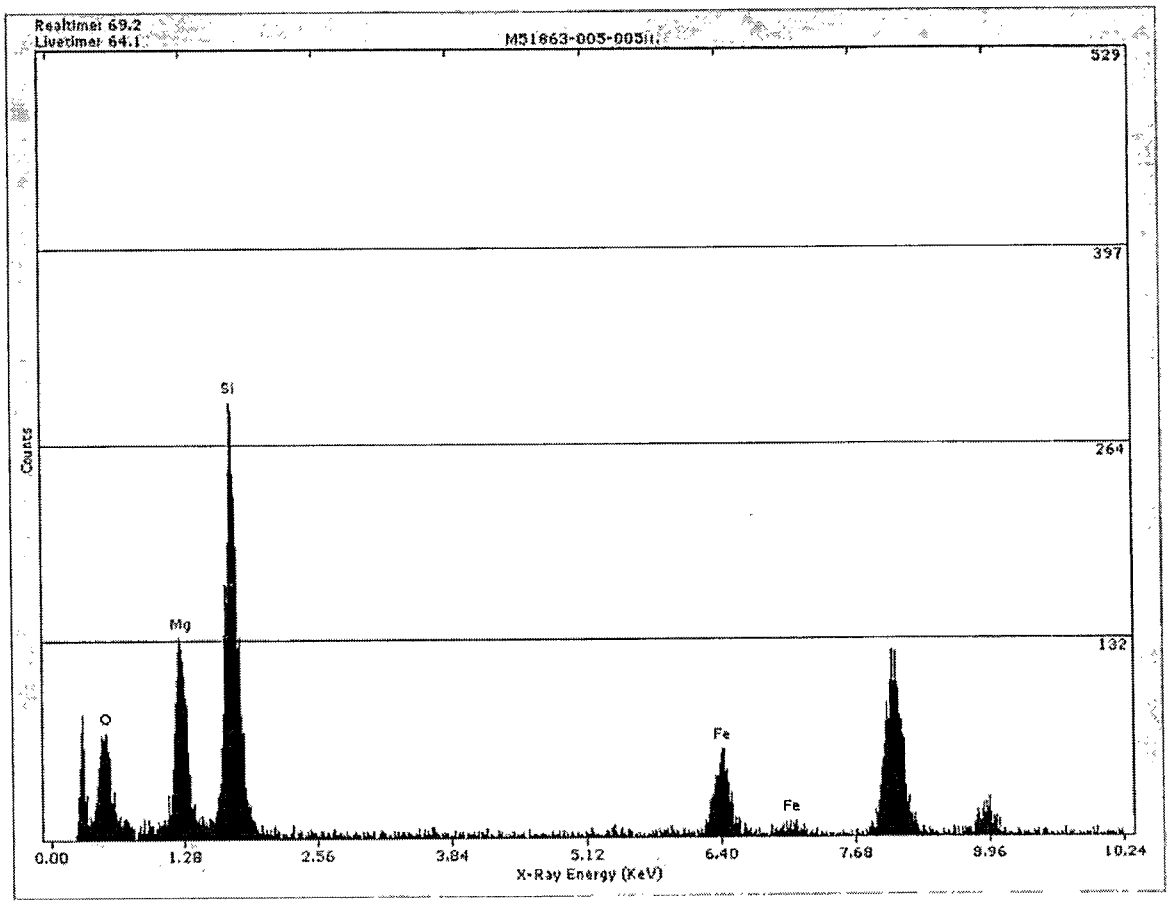
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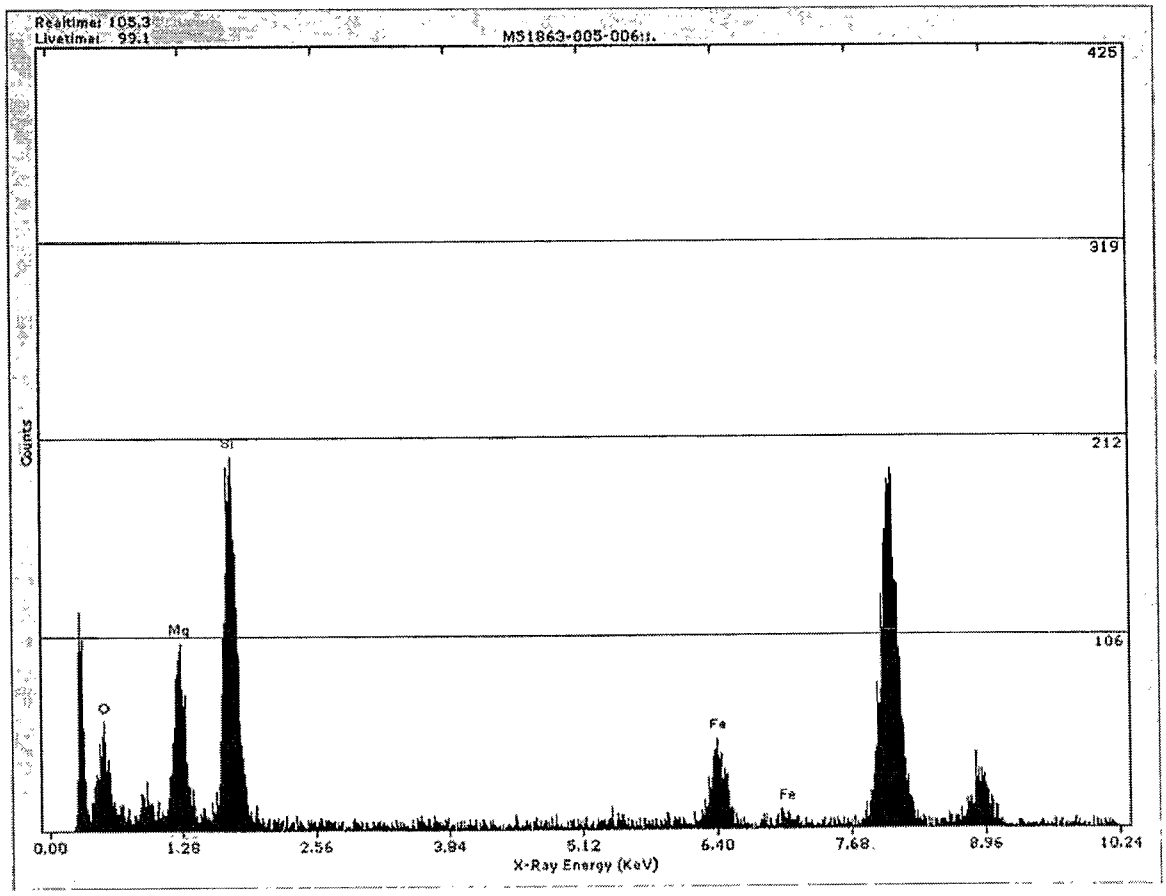

Realtime: 60.5
Livetime: 53.3
M51863-005-001
711
533
355
177
Counts
Si
Mg
O
C
Fe
Fe
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1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)

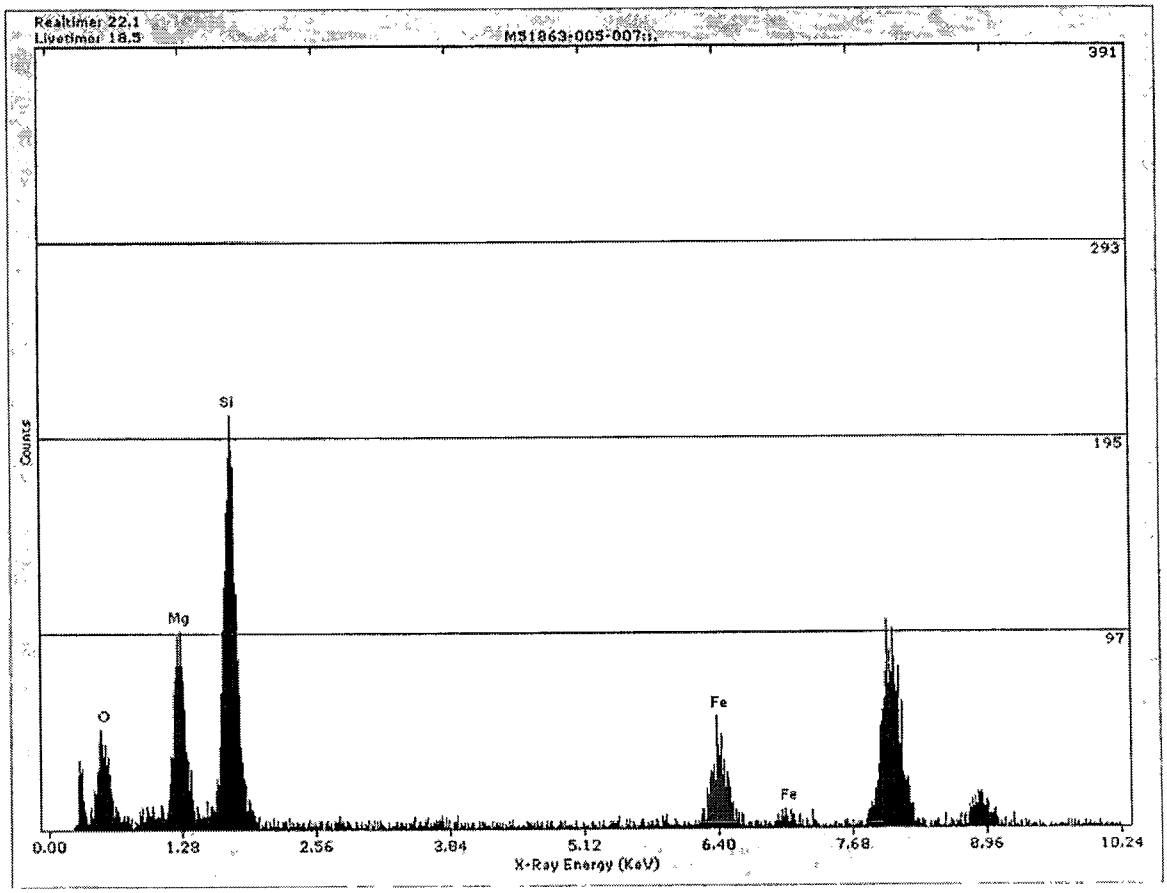

Realtime: 77.7
Livetime: 72.2
M51863-005-002II.
572
429
286
143
Counts
Si
Mg
O
Fe
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)

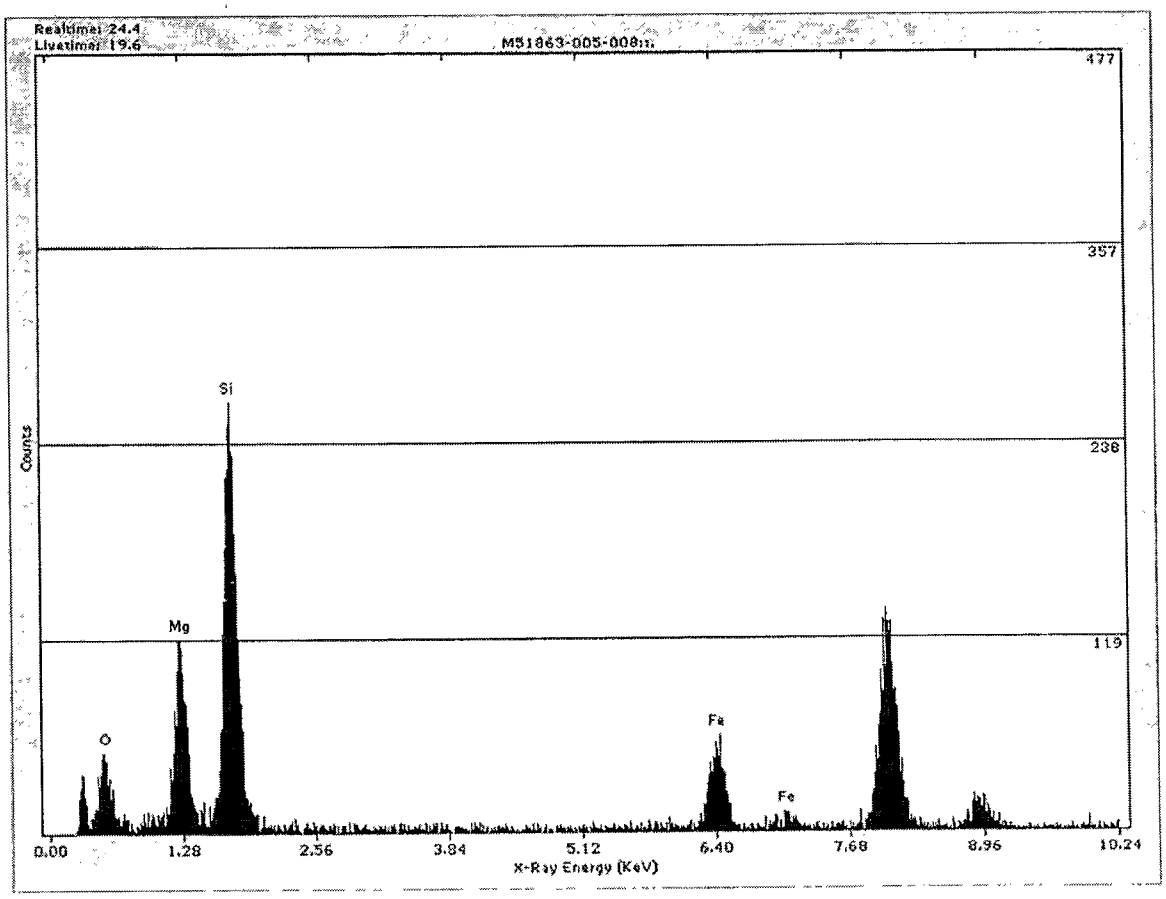

Realtime: 63.8
Livetime: 56.8
M51863-005-003.
698
523
349
174
Counts
O
Na
Mg
Si
Fe
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)

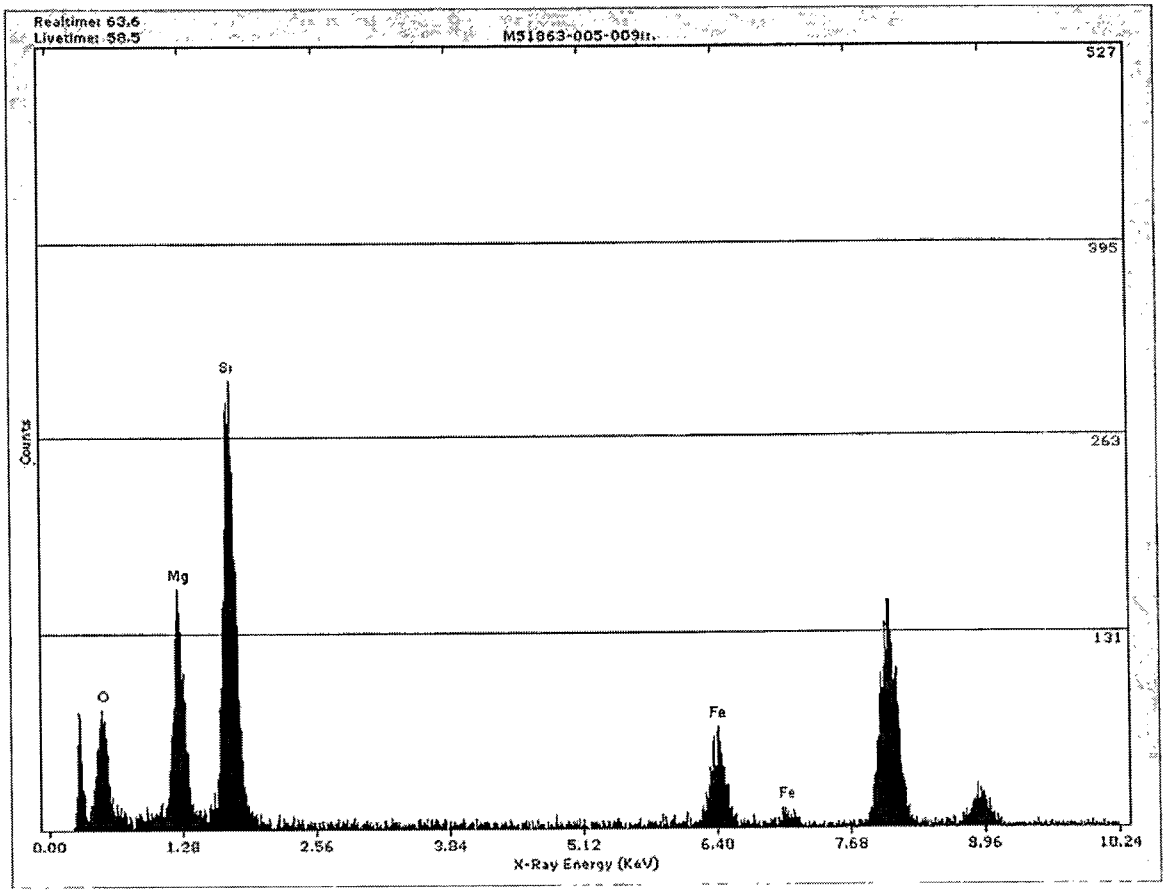

Realtime: 55.6
Livetime: 51.3
M51863-005-004n.
505
379
252
126
Counts
Si
Mg
O
Fe
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)

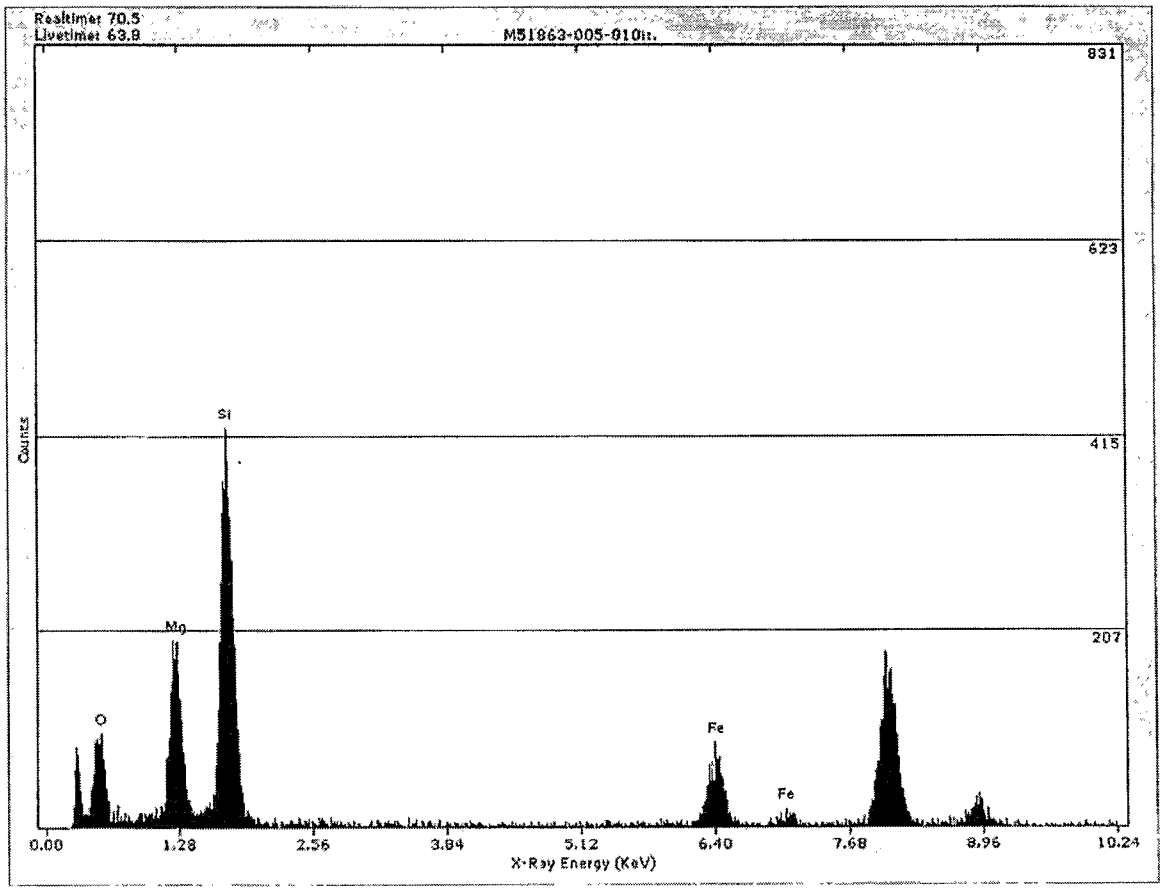

Realtime: 69.2
Livetime: 64.1
M31863-005-005ii
529
397
264
132
Counts
Si
Mg
O
Fe
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)

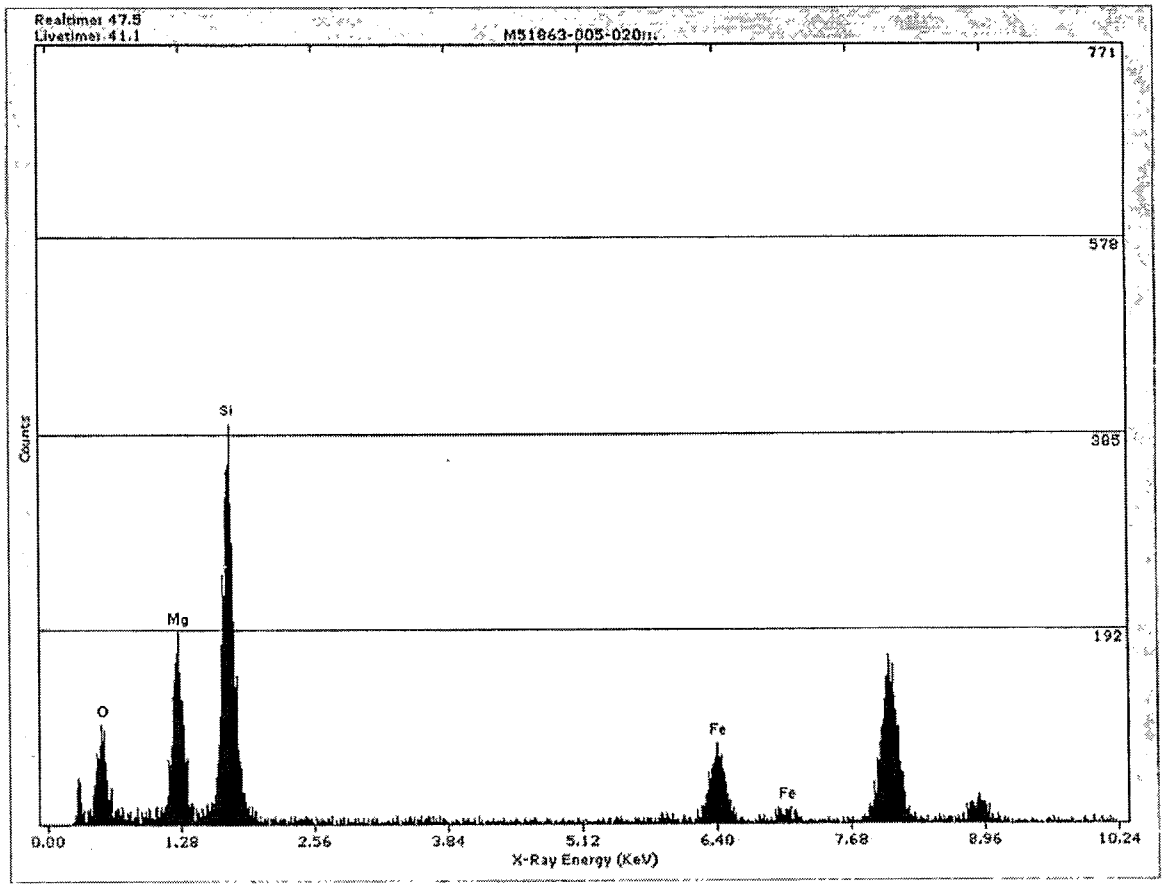

Realtime: 105.3
Livetime: 99.1
MS1863-005-006.
425
319
212
106
Counts
Si
Mg
O
Fe
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)

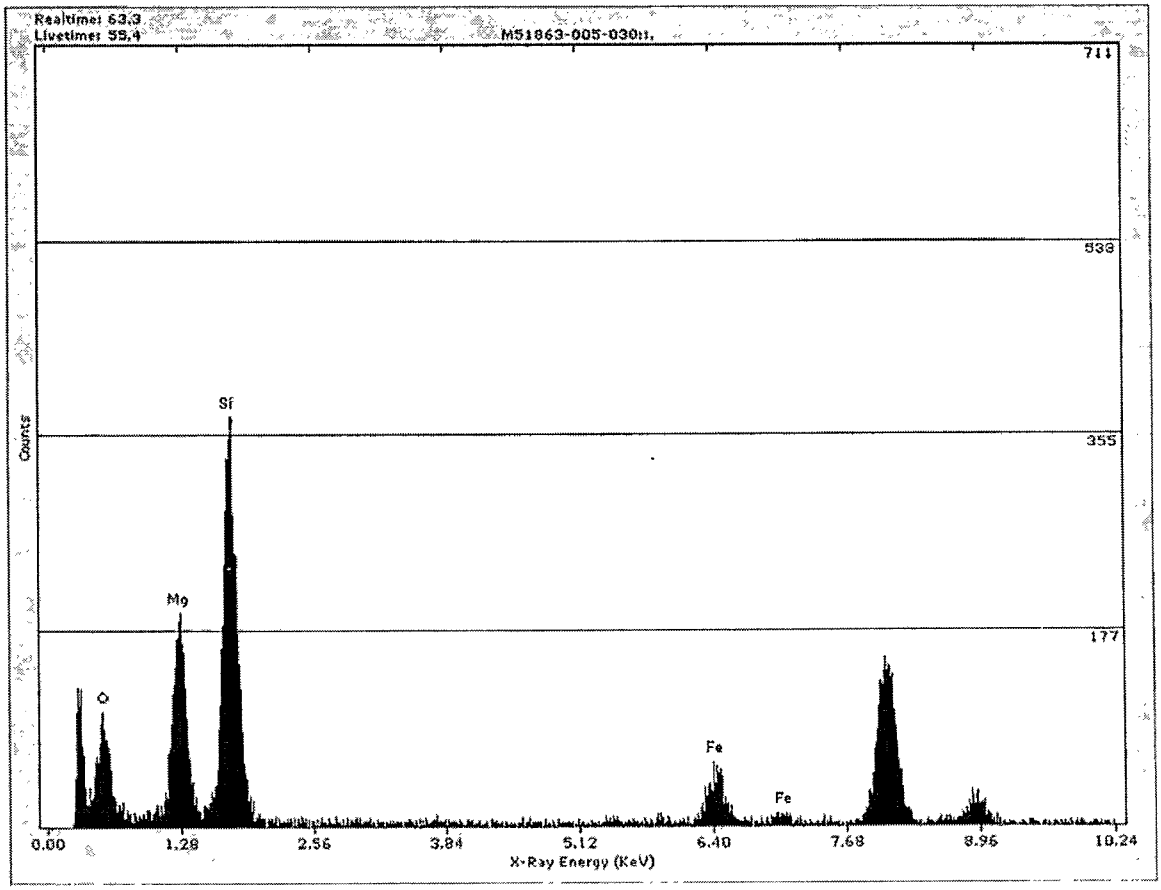

Realtime 22.1
Livetime 18.5
M31863-005-007.ir
391
293
195
97
Counts
Si
Mg
O
Fe
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)

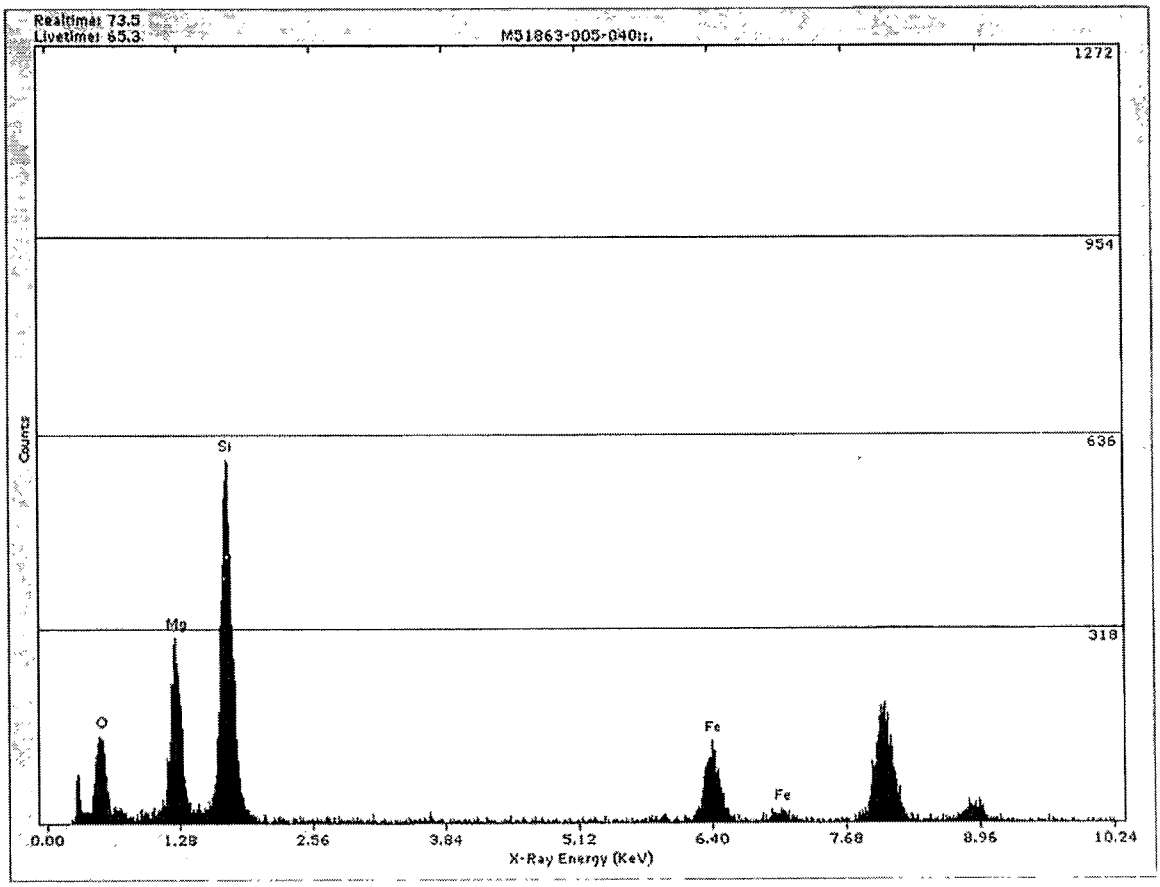

Realtime: 24.4
Livetime: 19.6
M51863-005-008.n.
477
357
238
119
Counts
Si
Mg
O
Fe
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)

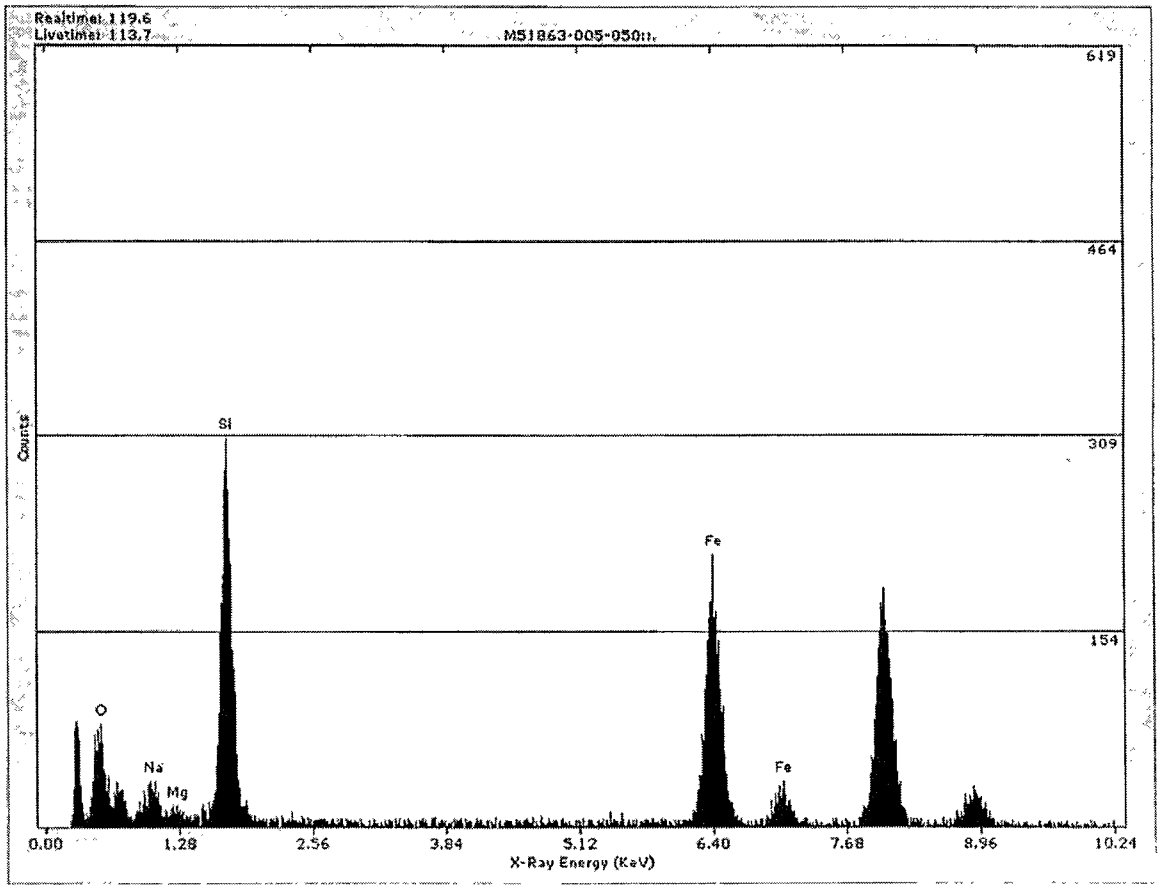

Realtime: 63.6
Livetime: 58.5
M51863-005-009.
527
395
263
131
Counts
O
Mg
Si
Fe
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)

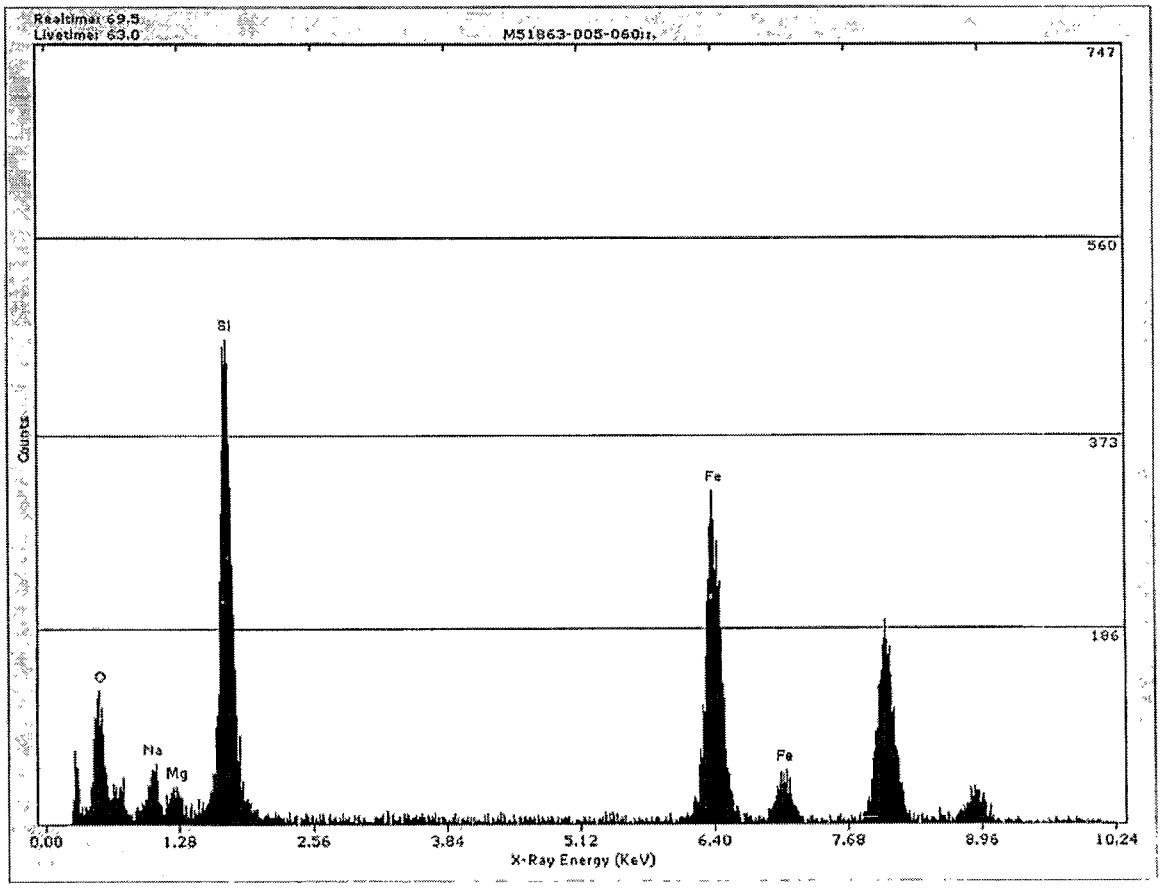

Realtime 70.5
Livetime 63.9
M51863-005-010.
831
623
415
207
Counts
Si
Mg
O
Fe
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)

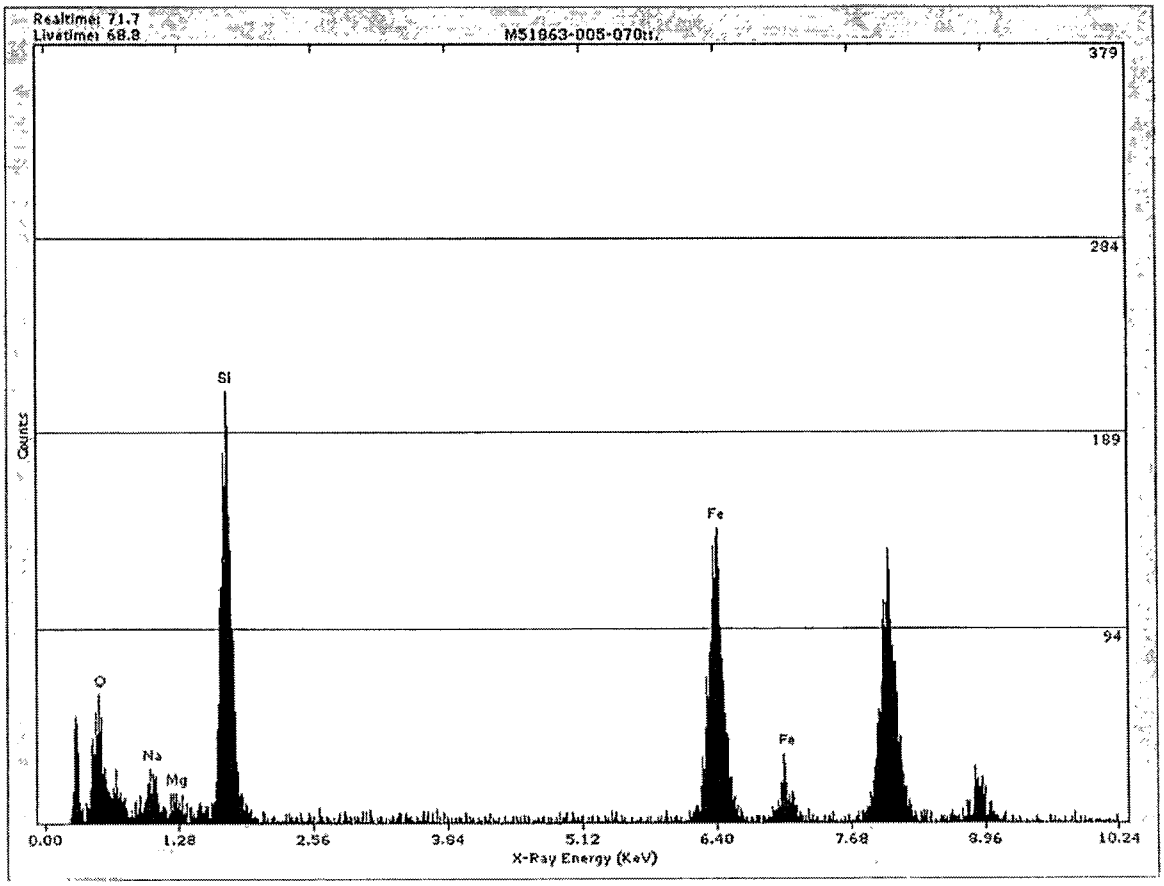

Realtime: 47.5
Livetime: 41.1
M51863-005-020
771
578
385
192
Counts
Si
Mg
O
Fe
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)

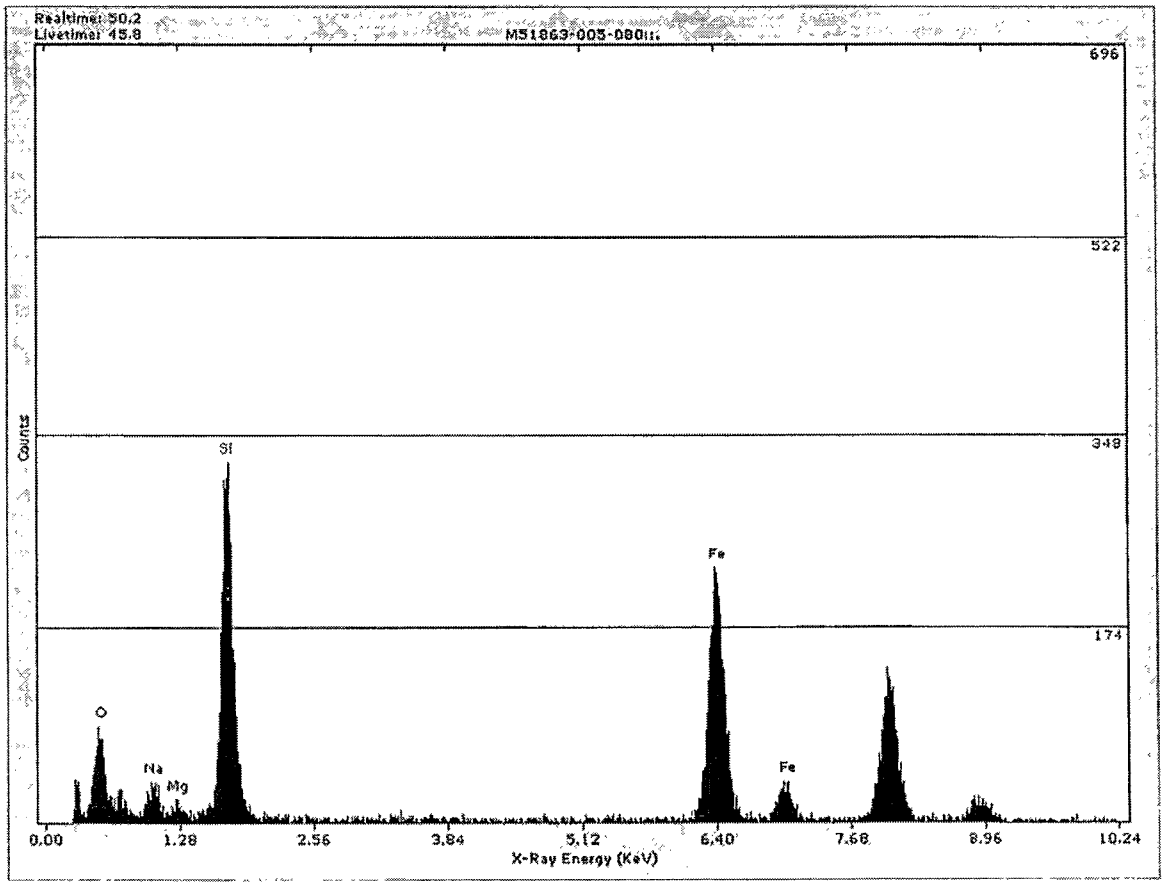

Realtime: 63.3
Livetime: 55.4
M51863-005-030.rl,
711
533
355
177
Counts
Si
Mg
O
Fe
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)

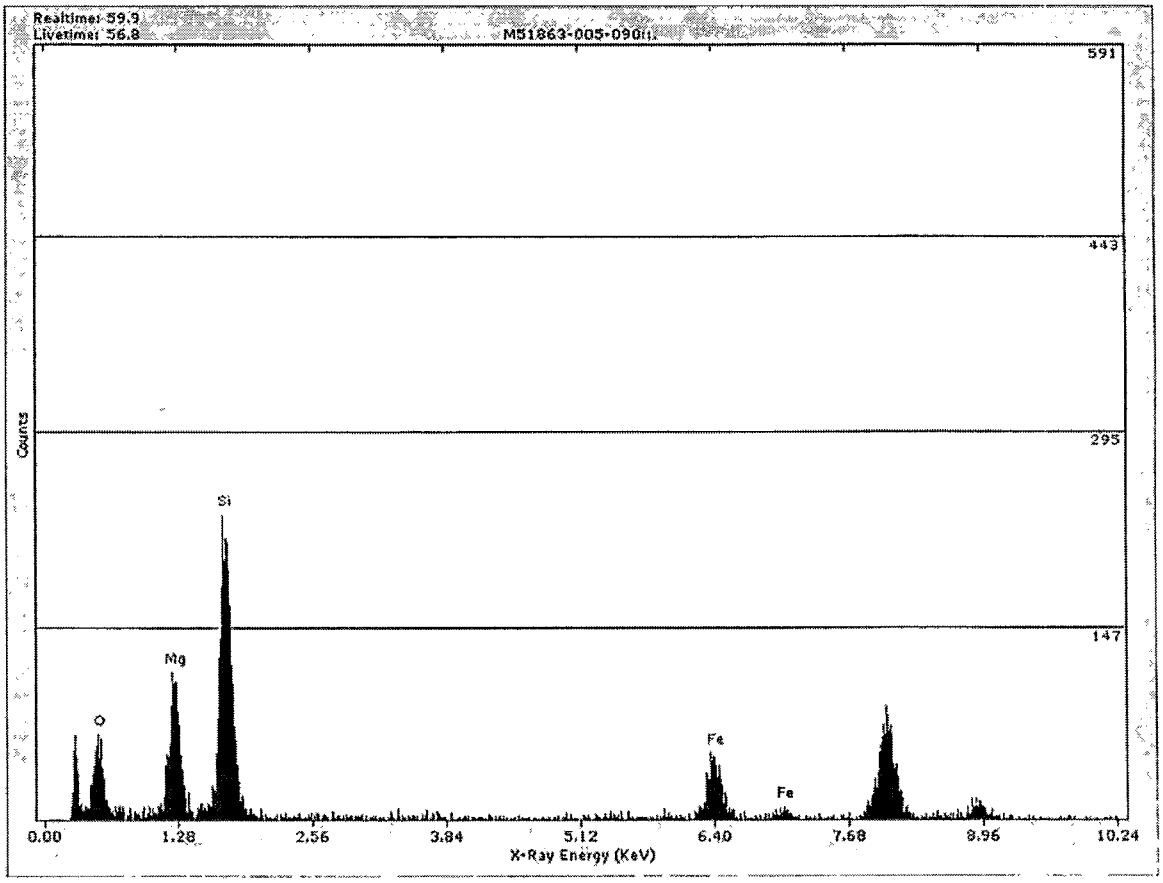

Realtime: 73.5
Livetime: 55.3
M51863-005-040::.
1272
954
636
318
Counts
Si
Mg
O
Fe
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)

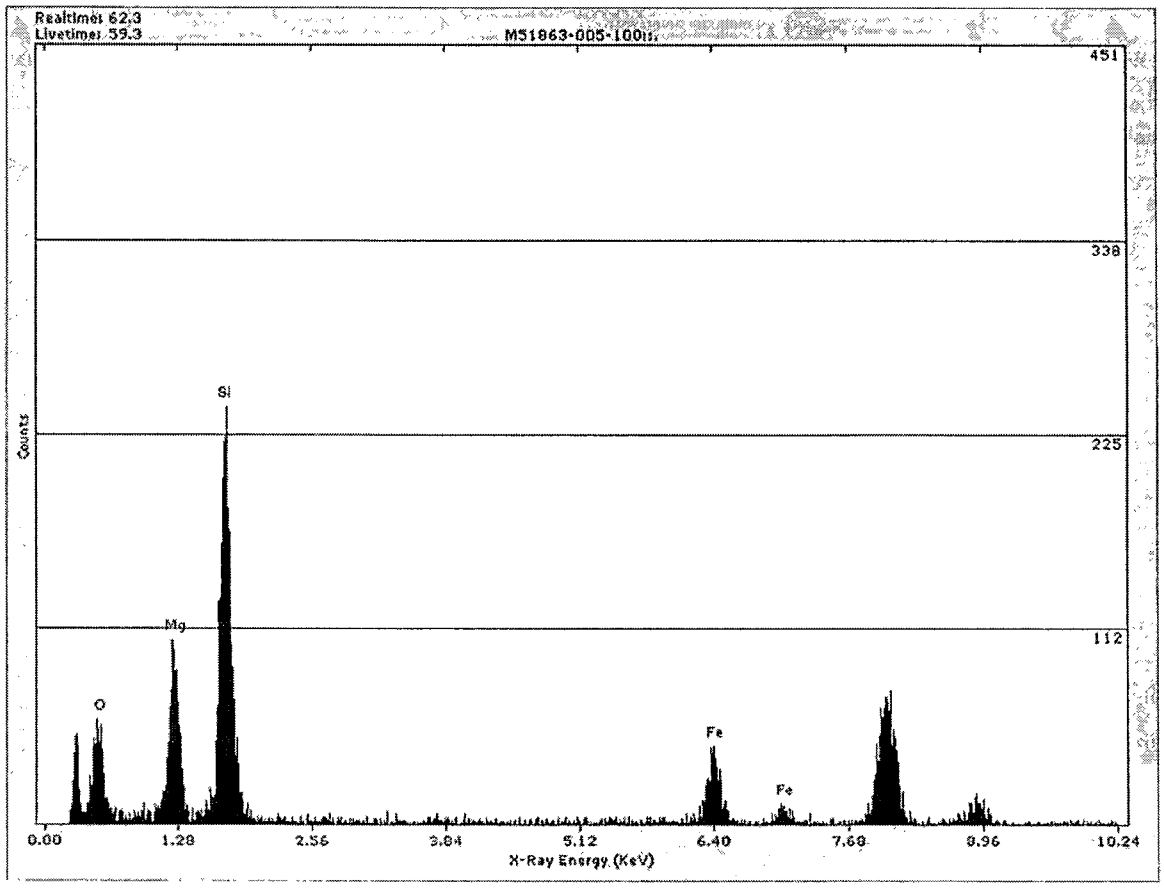

Realtime: 119.6
Livetime: 113.7
M51863-005-050n.
619
464
309
154
Counts
Si
Fe
Fe
O
Na
Mg
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)

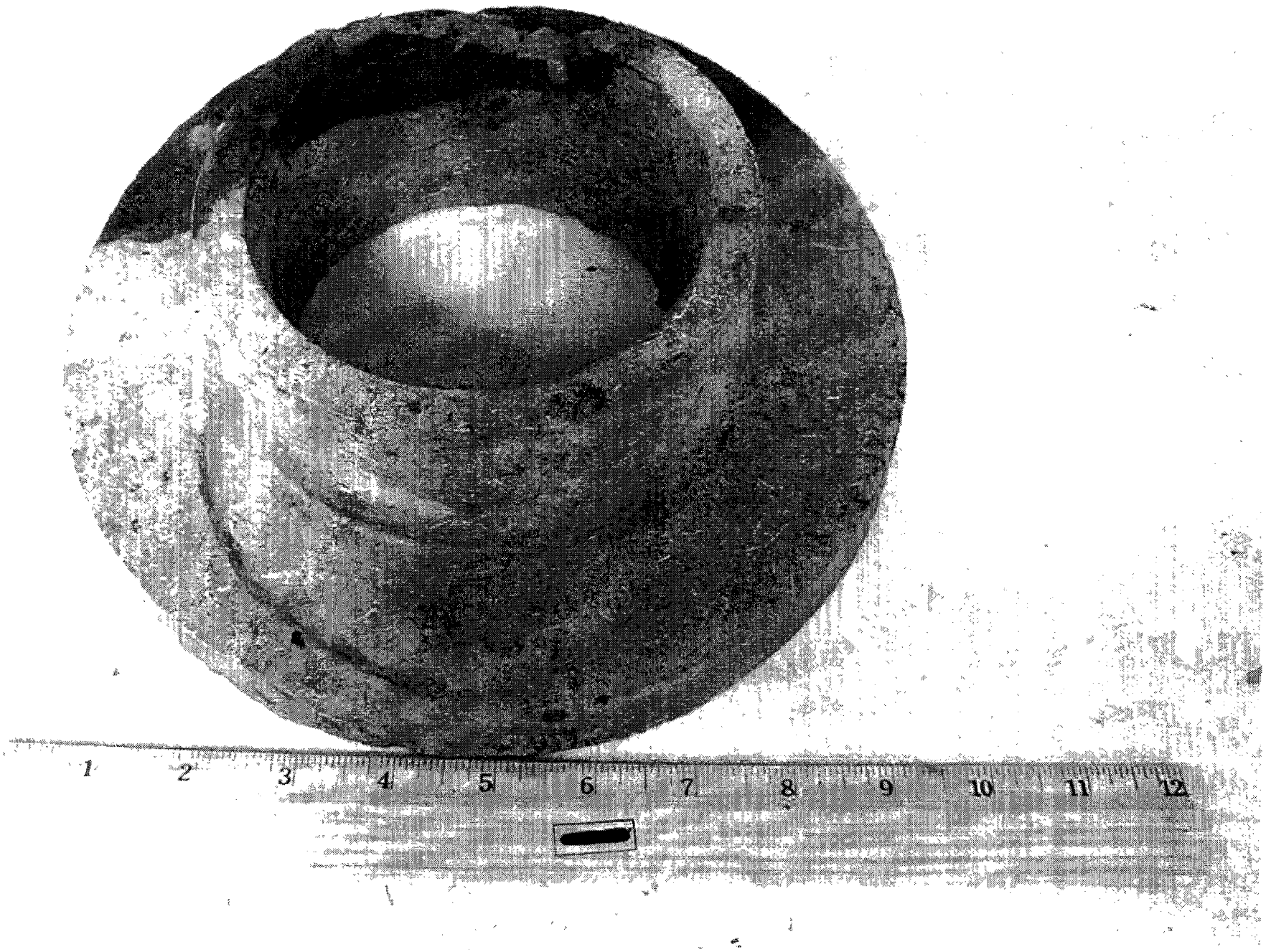

Realtime: 69.5
Livetime: 63.0
M51863-005-060i1
747
560
373
186
Counts
O
Na
Mg
Si
Fe
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)

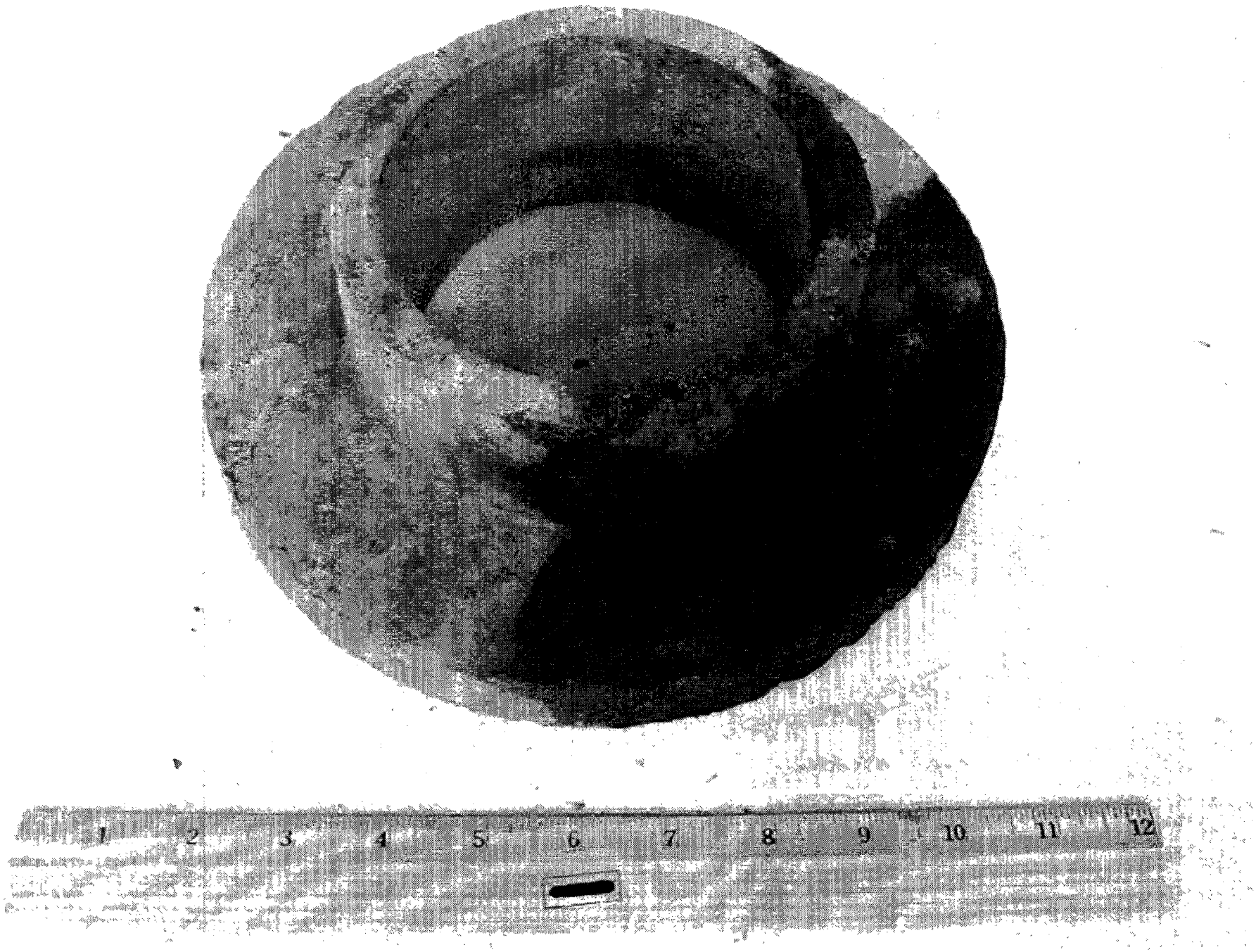

Realtime: 71.7
Live time: 68.8
M51863-005-070ti
379
284
189
94
Counts
Si
Fe
O
Na
Mg
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)

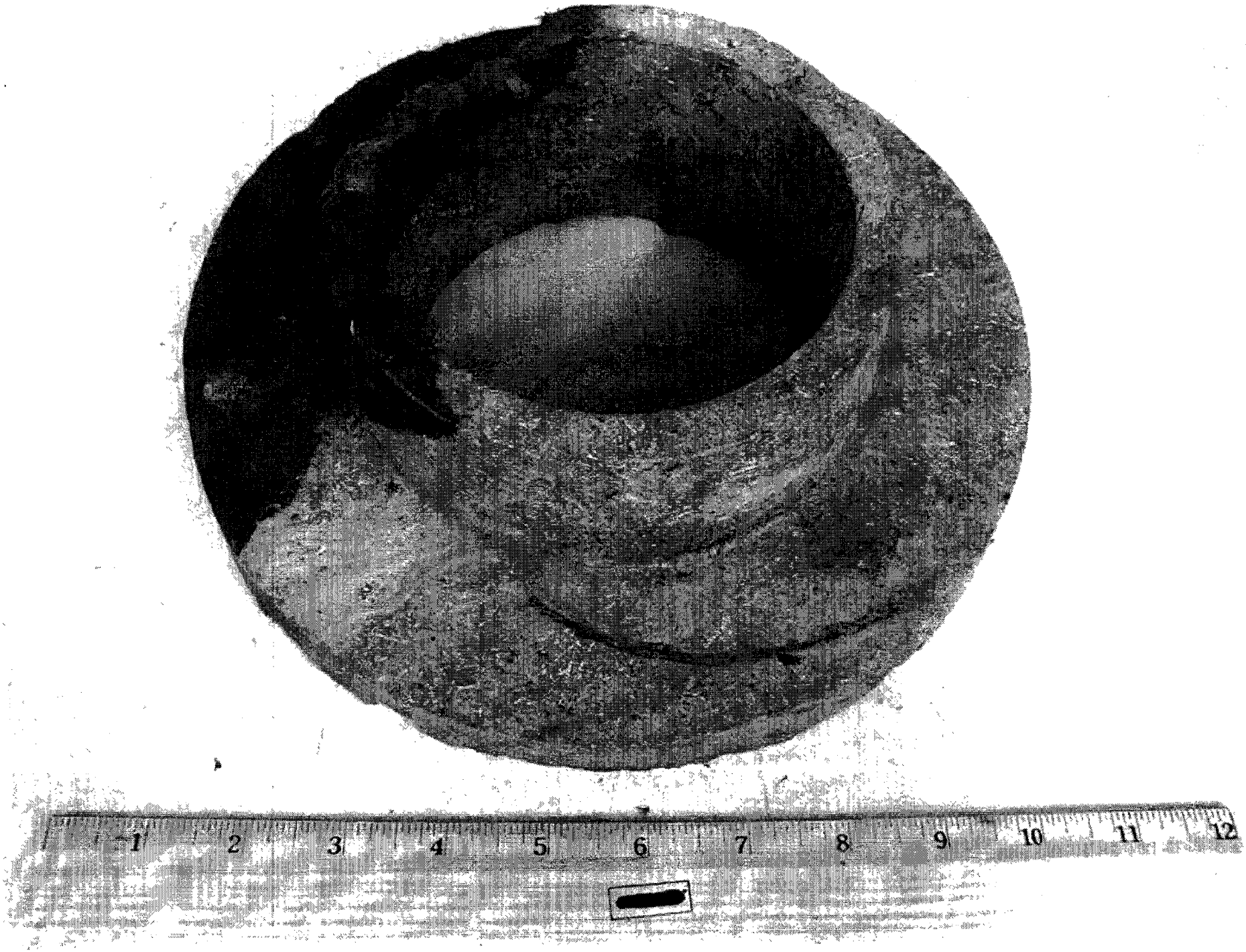

Realtime: 50.2
Livetime: 45.8
MS1863-003-080II:
696
522
349
174
Counts
O
Na
Mg
Si
Fe
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)

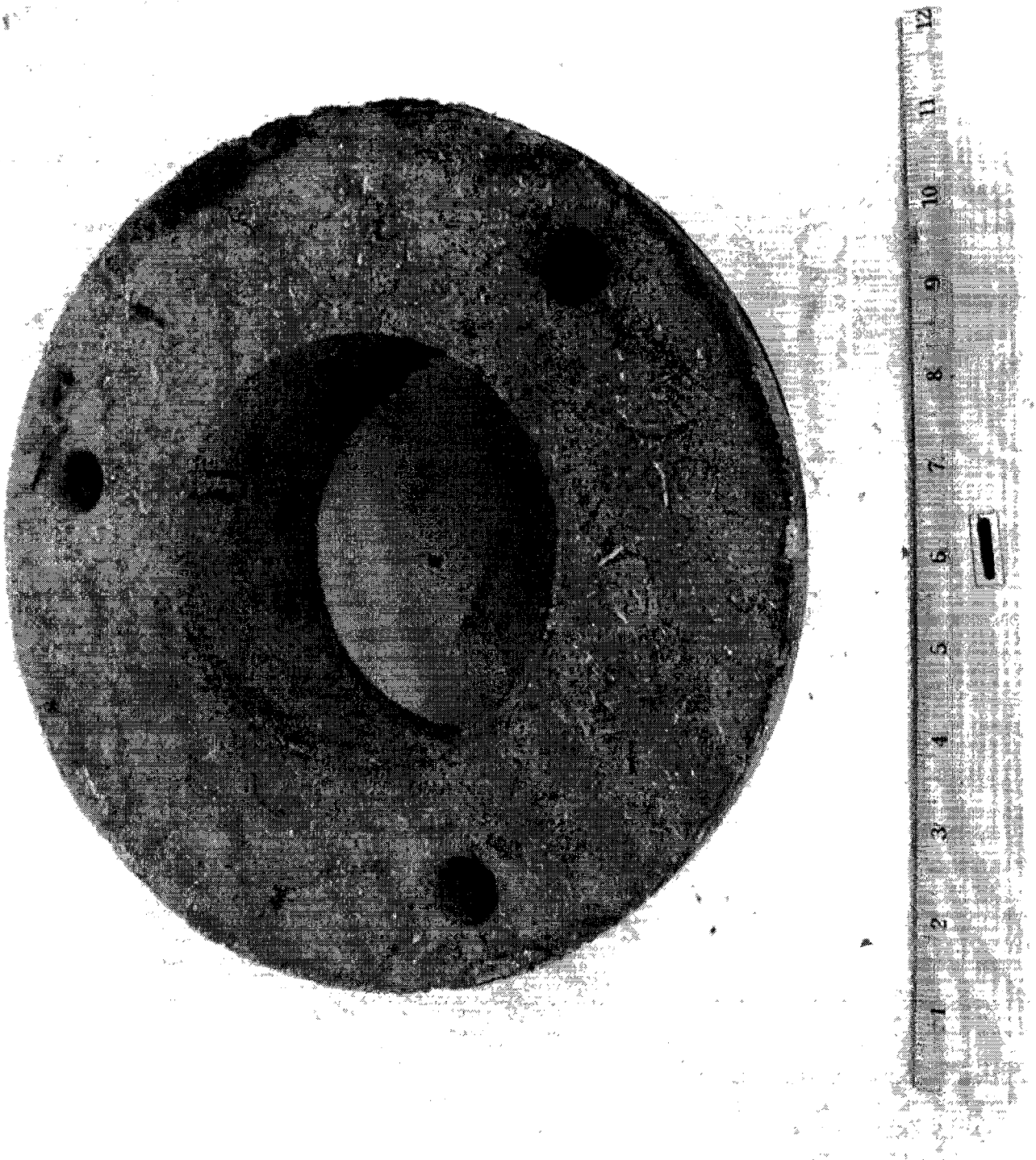

Realtime: 59.9
Live time: 56.8
M51863-005-090(1)
591
443
295
147
Counts
Si
Mg
O
Fe
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)


Realtime: 62.3
Livetime: 59.3
M51863-005-100ts
451
338
225
112
Counts
Si
Mg
O
Fe
Fe
0.00
1.28
2.56
3.84
5.12
6.40
7.68
8.96
10.24
X-Ray Energy (KeV)

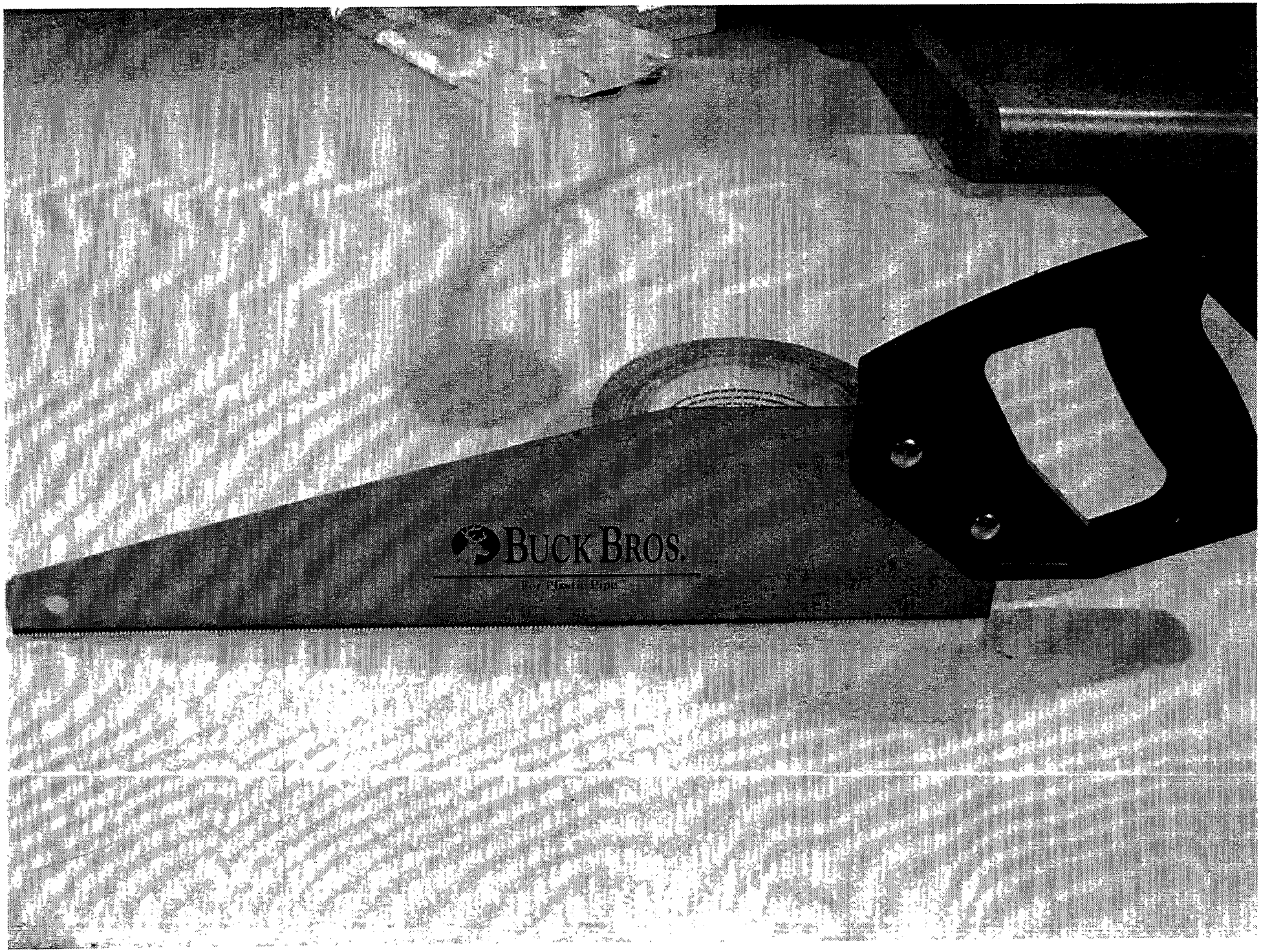

1
2
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11
12

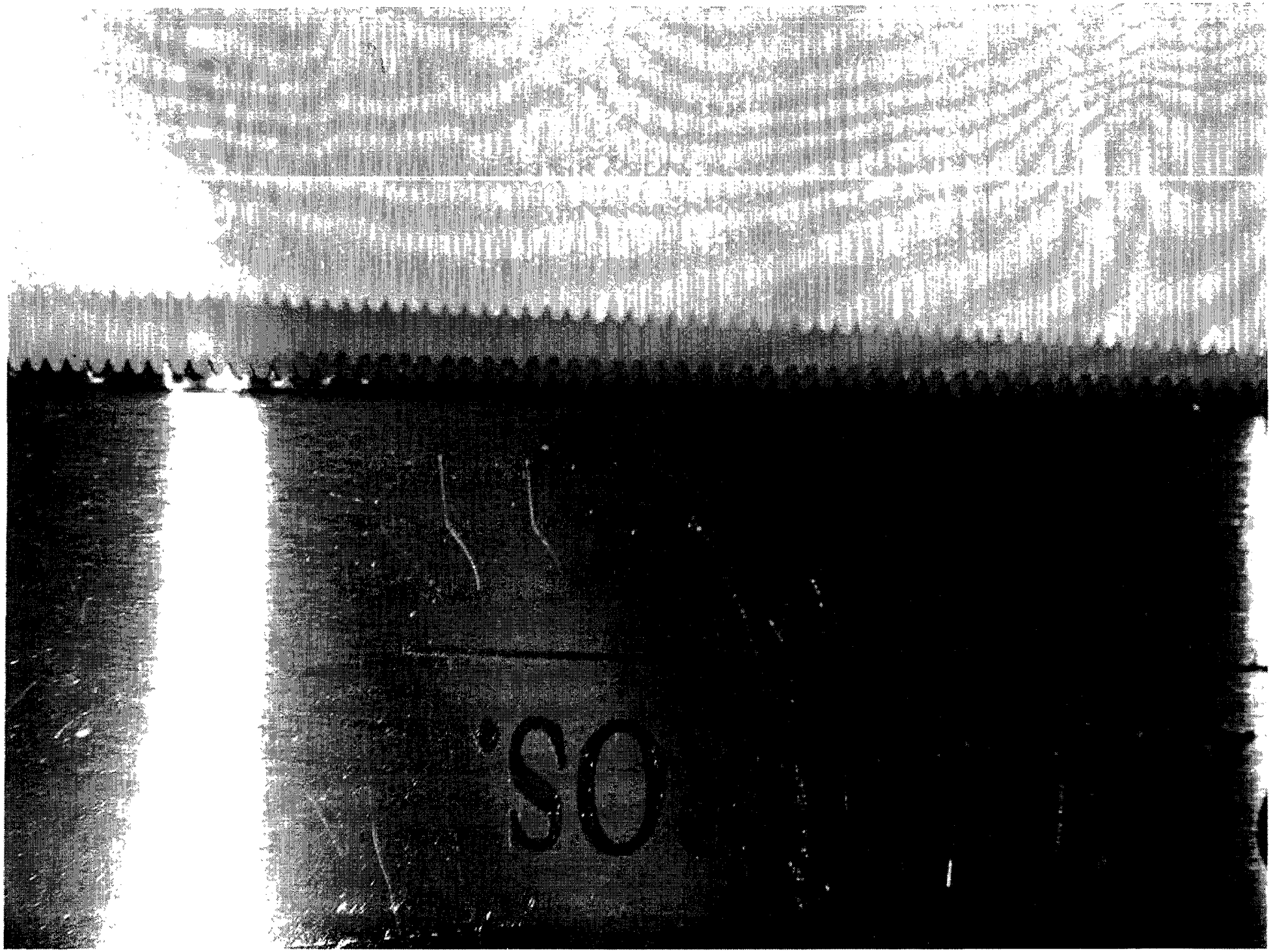

1
2
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11
12


1
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12




BUCK BROS.
13" PVC ABS PLASTIC PIPE SAW
FOR CUTTING PLASTIC PIPE

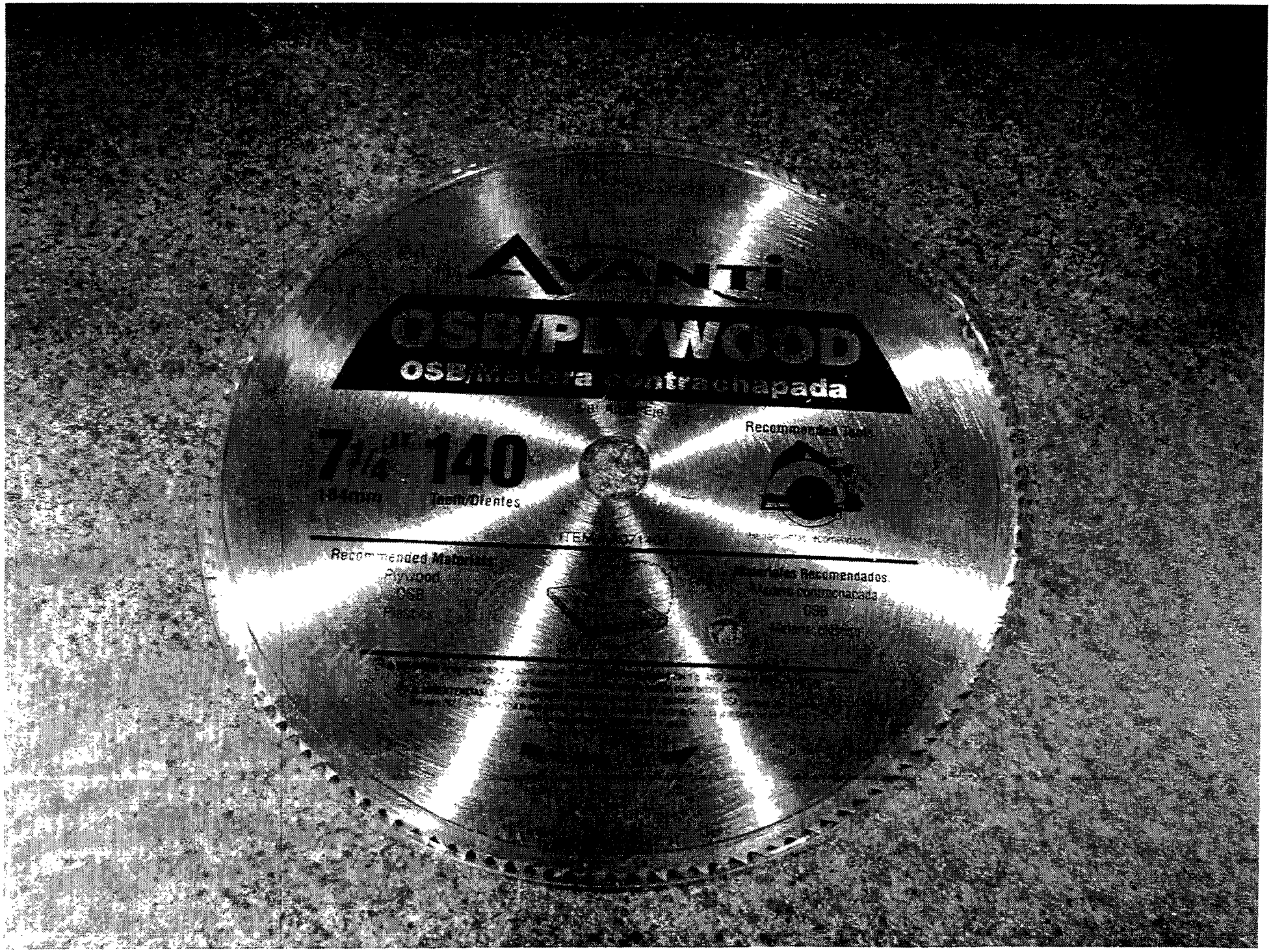

BUCK BROS.


'80

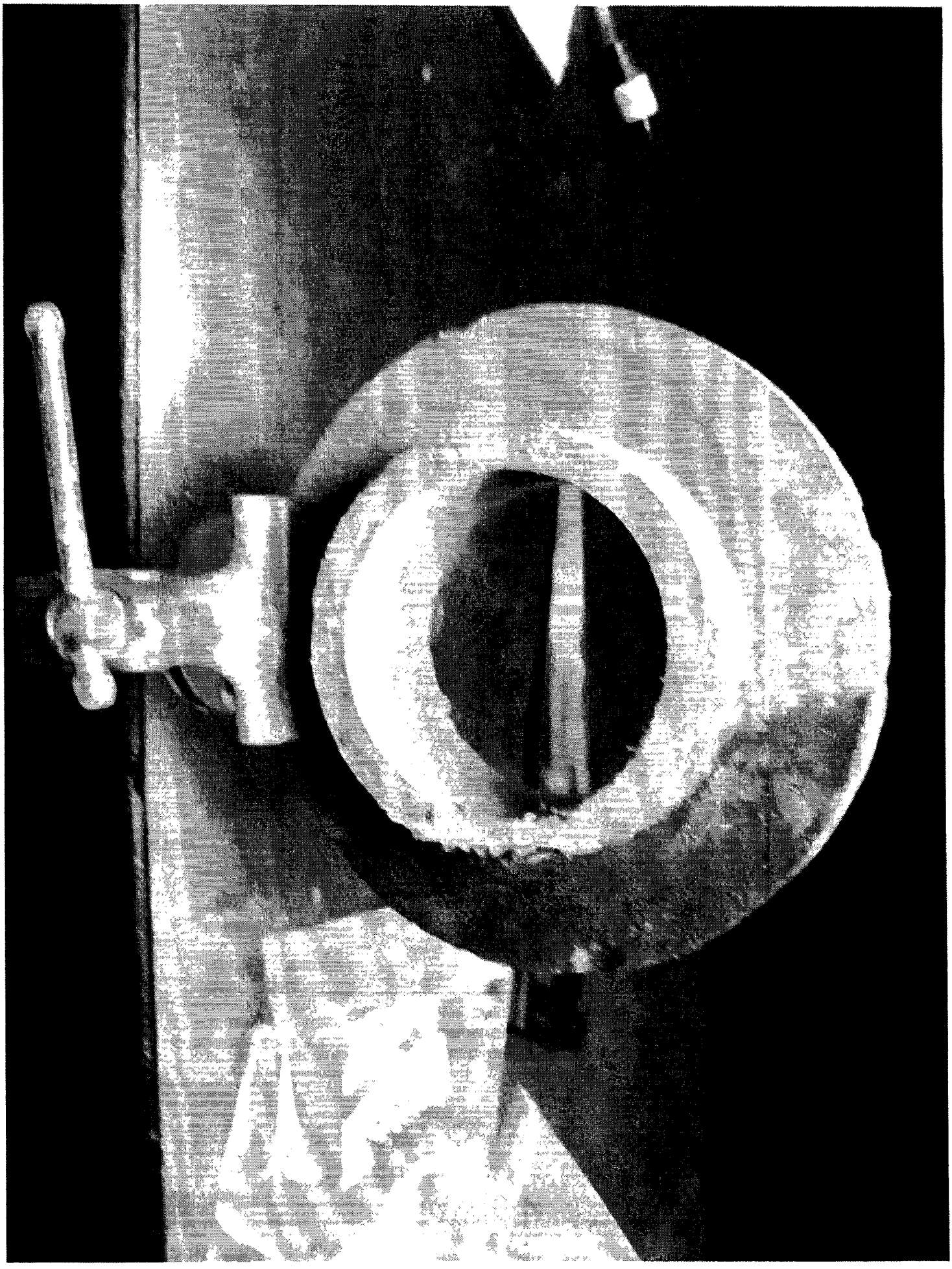

SKIL
Do it right. Do it with Skil.™
2.4 HP SKILSAW®
7-¼ in. CIRCULAR SAW
SIERRA CIRCULAR DE 7-¼ pulgadas (18,4 cm)
SCIE CIRCULAIRE DE 7-¼ po (18,4 cm)
Patented anti-snag lower guard
Rear view depth adjustment
Accu-Sight™
Protector inferior antienganches patentado
Ajuste de profundidad de vista posterior
Accu-Sight™
Garde inférieur breveté de protection contre les éboulures
Réglage de la profondeur à rétrovision
Accu-Sight™
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24-TOOTH CARBIDE BLADE
HOJA DE CARBURO DE 24 DIENTES
LAME AU CARBURE A 24 DENTS
SKILSAW
2.4
24
13
5585-01

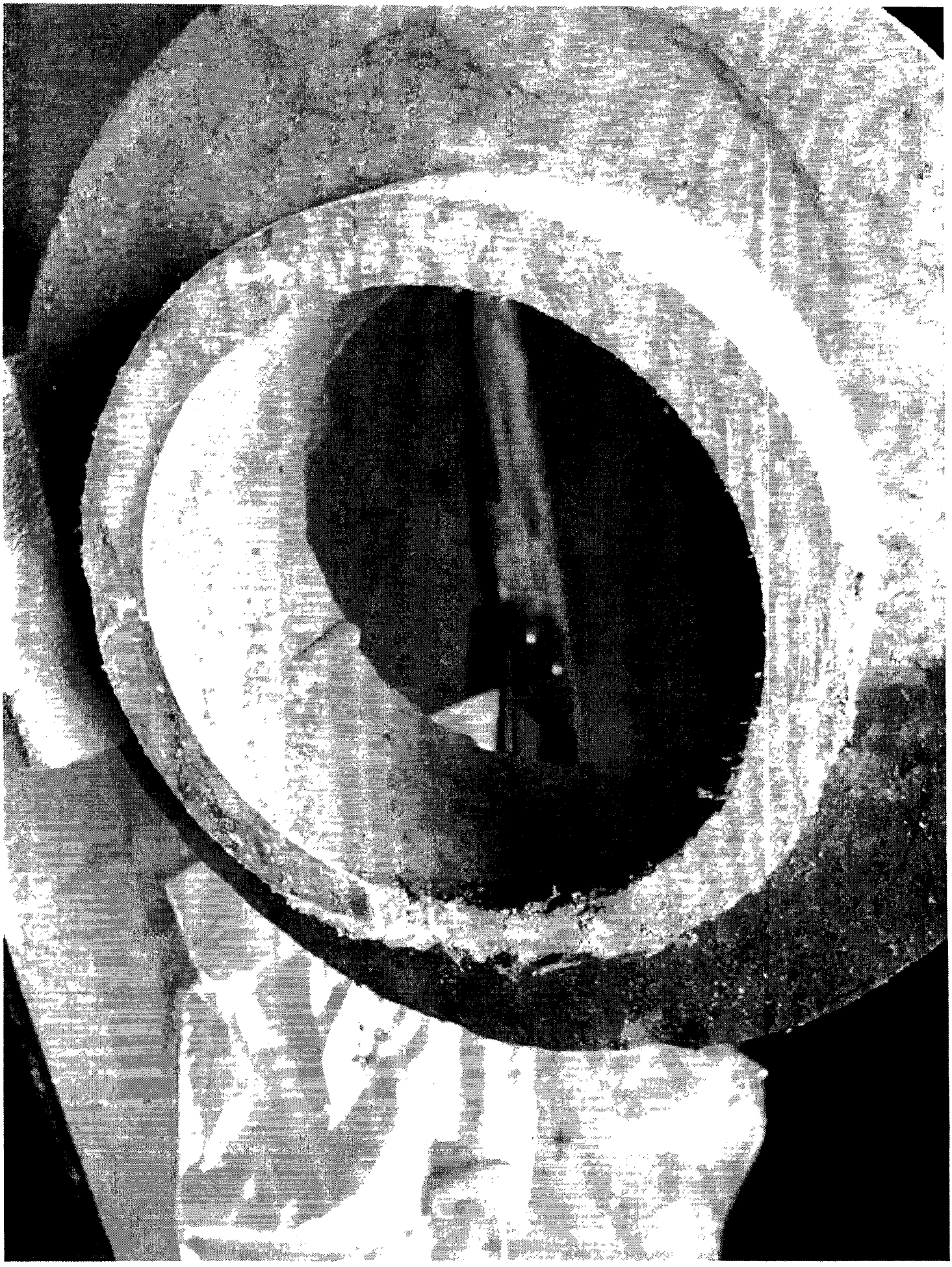

SKILSAW
2.4
HP
13
AMP


SKILSAW
2.4
HP
13
AMP


AVANTI
OSB/PLYWOOD
OSB/Madera contrachapada
7¼"
184mm
140
Teeth/Dientes
Recommended Materials:
Plywood
OSB
Plastics
Materiales Recomendados:
Madera contrachapada
OSB

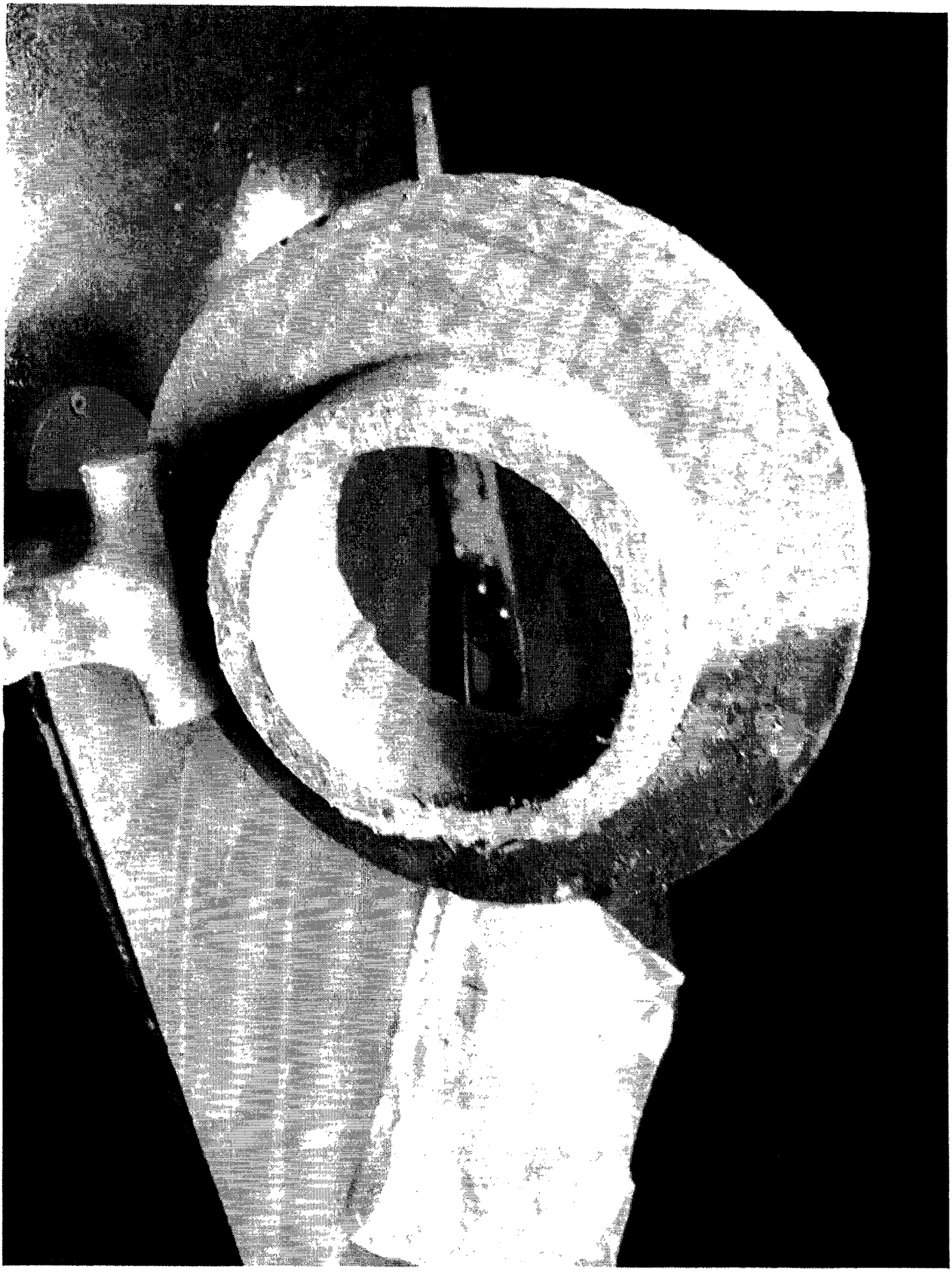

DEWALT
Abrasive Saw Blade
WARNING
ADVERTENCIA
AVERTISSEMENT
0 28874 0352 6

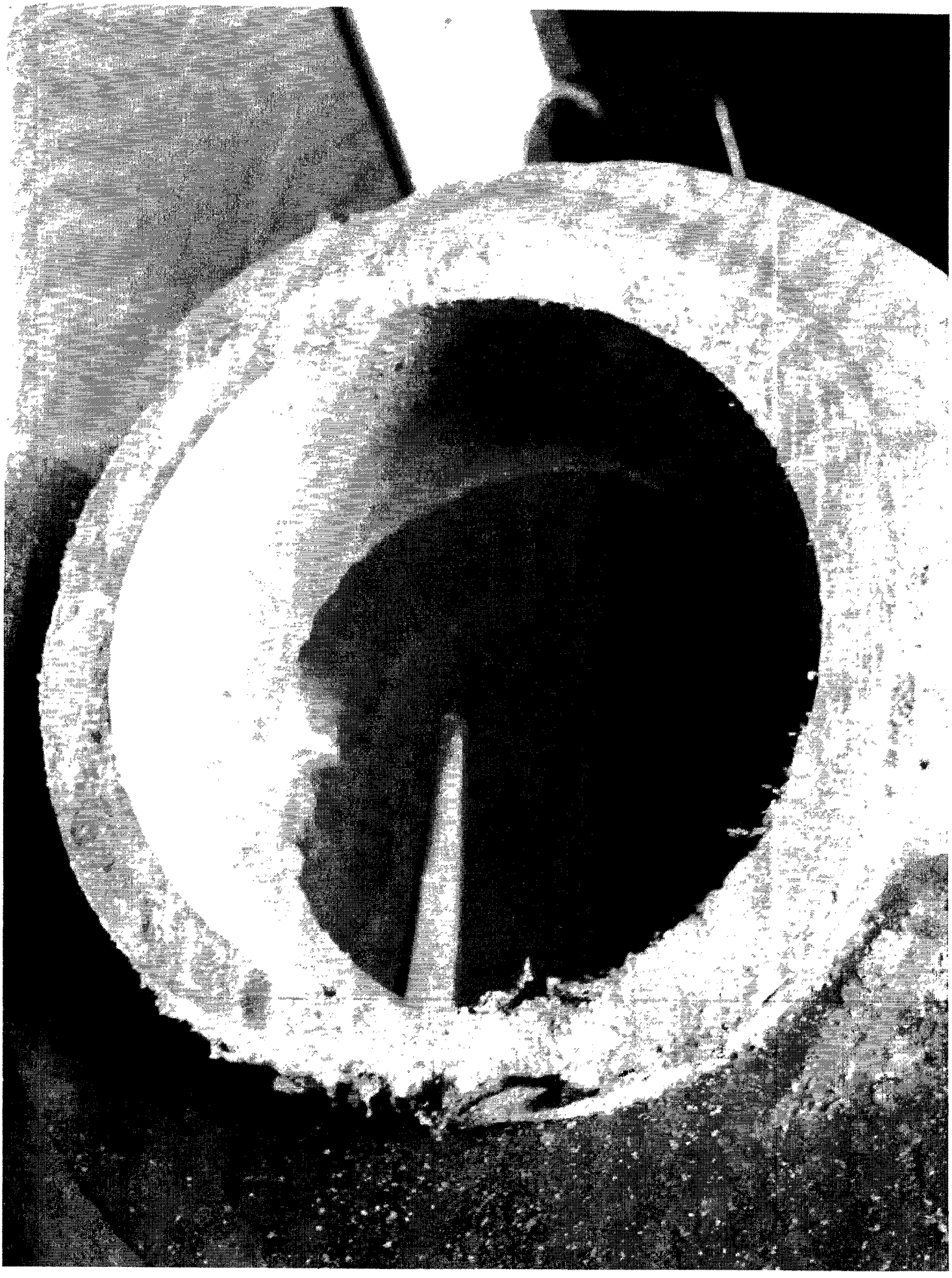


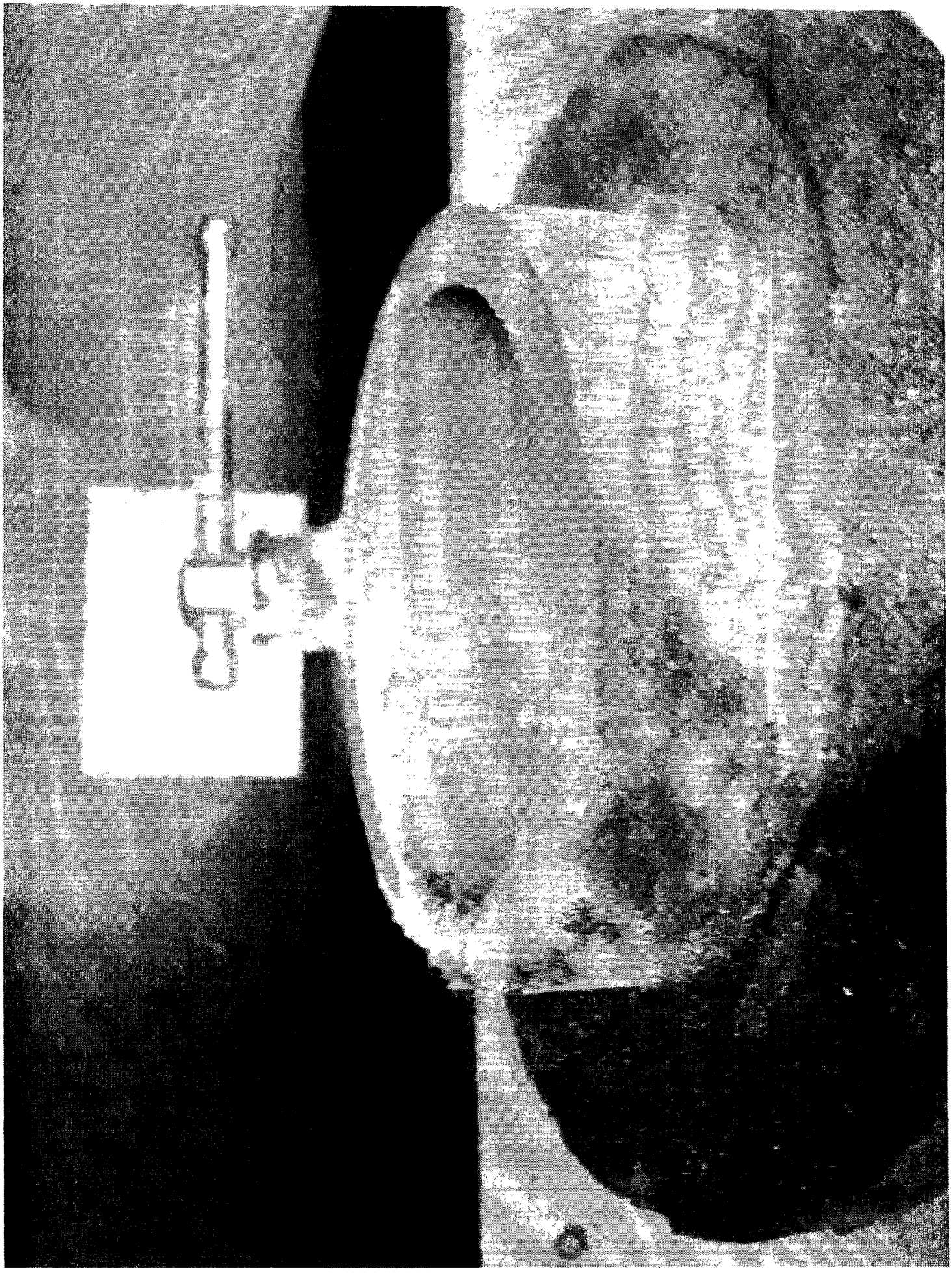


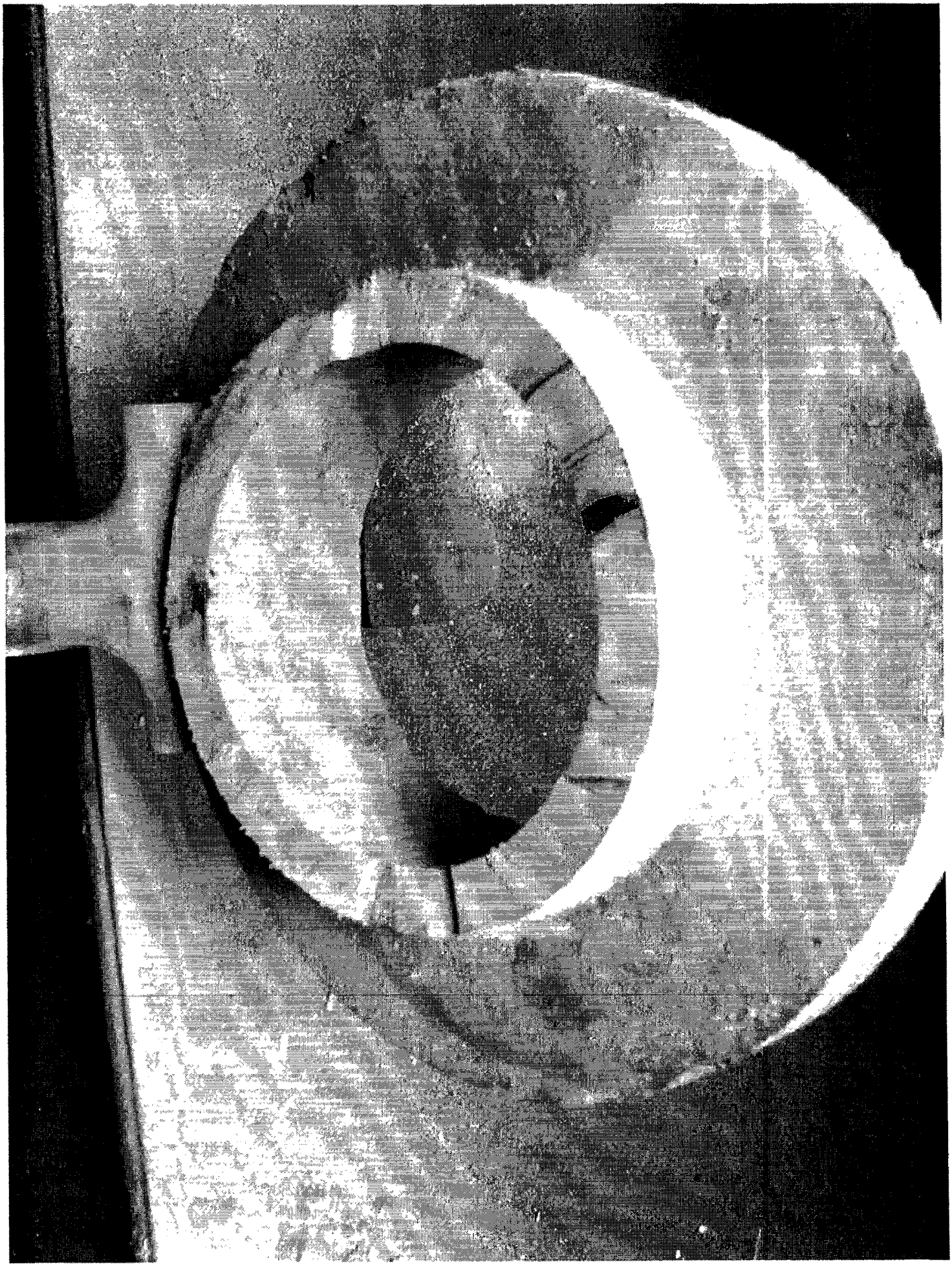


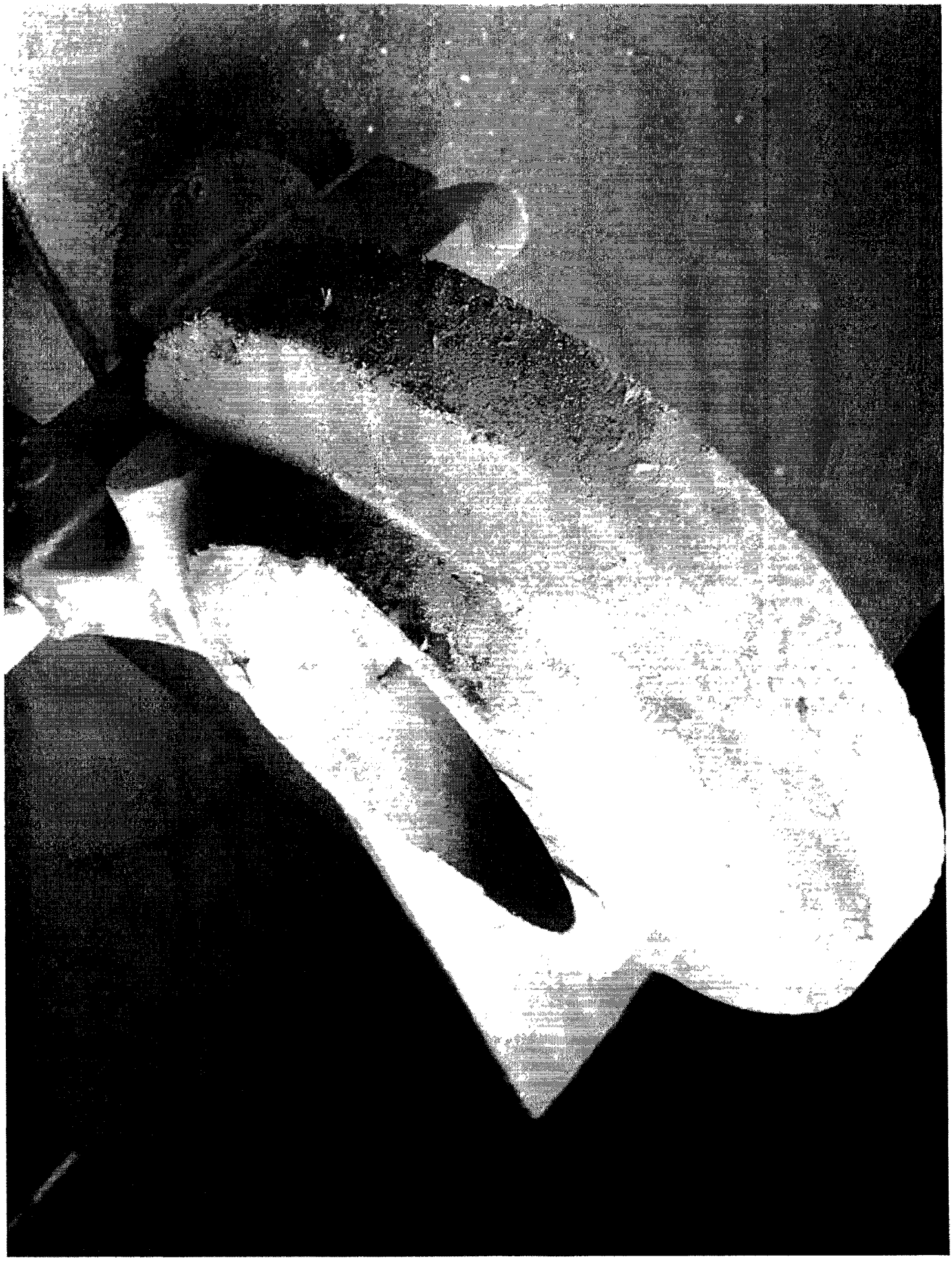


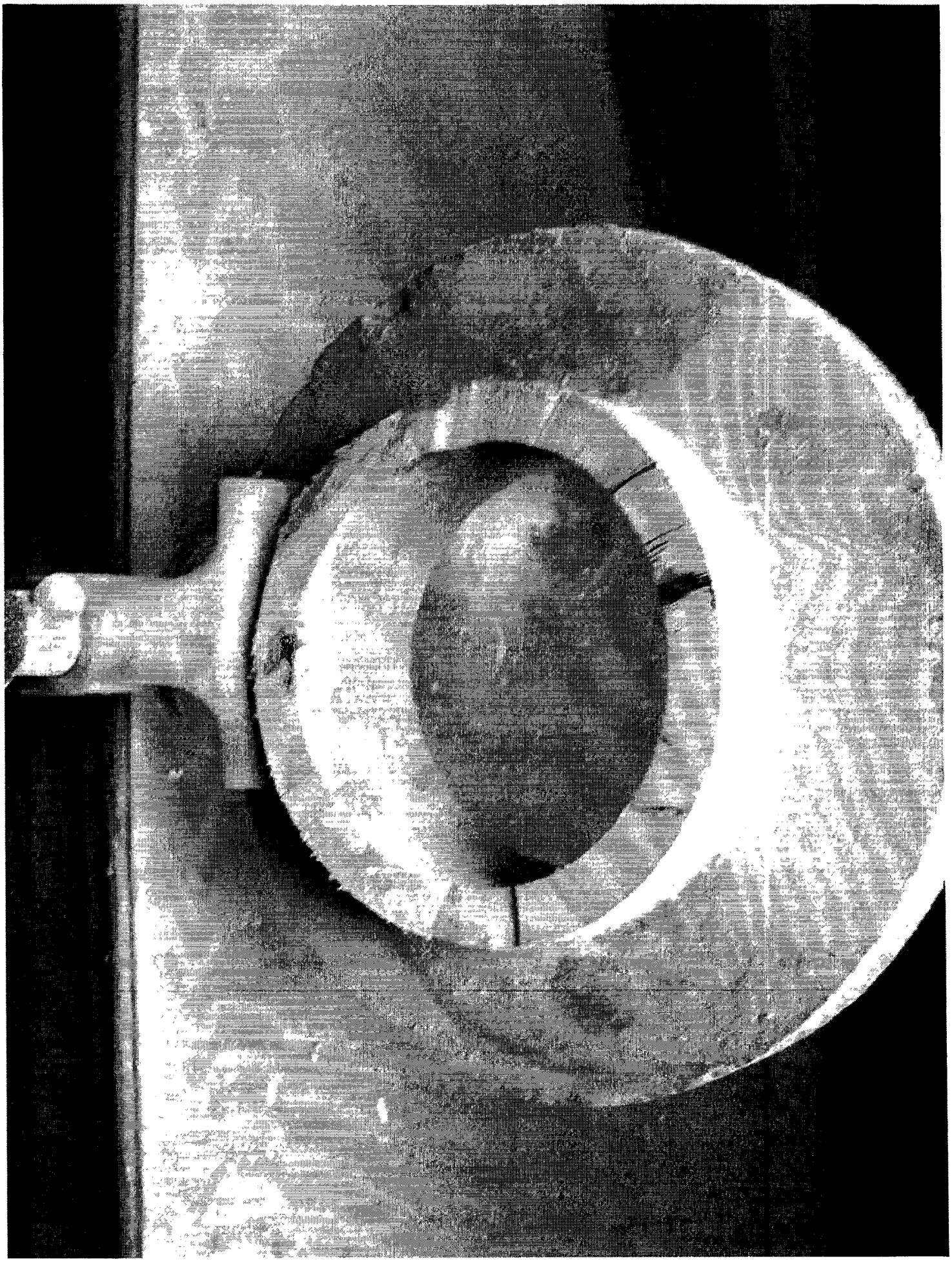


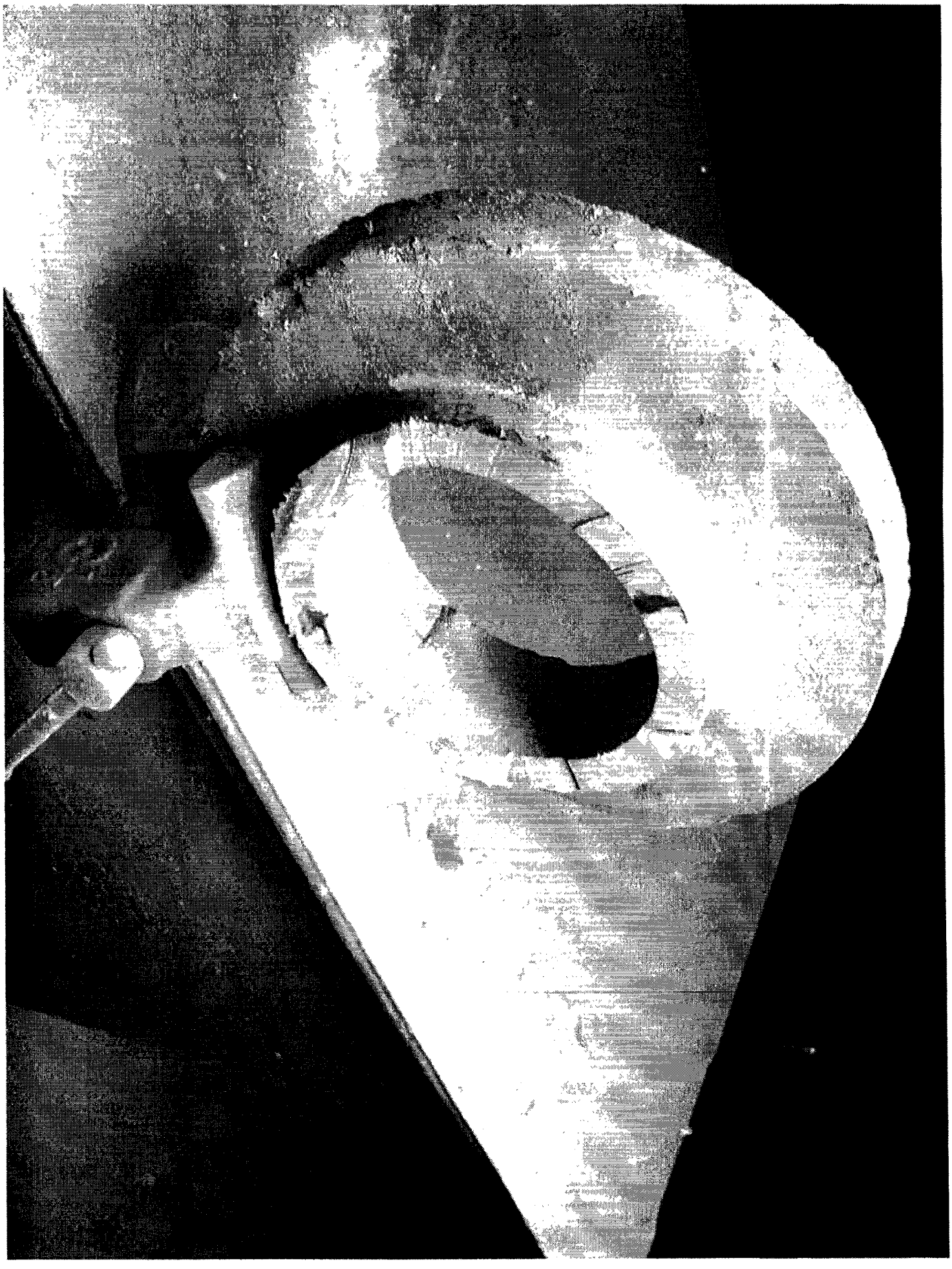




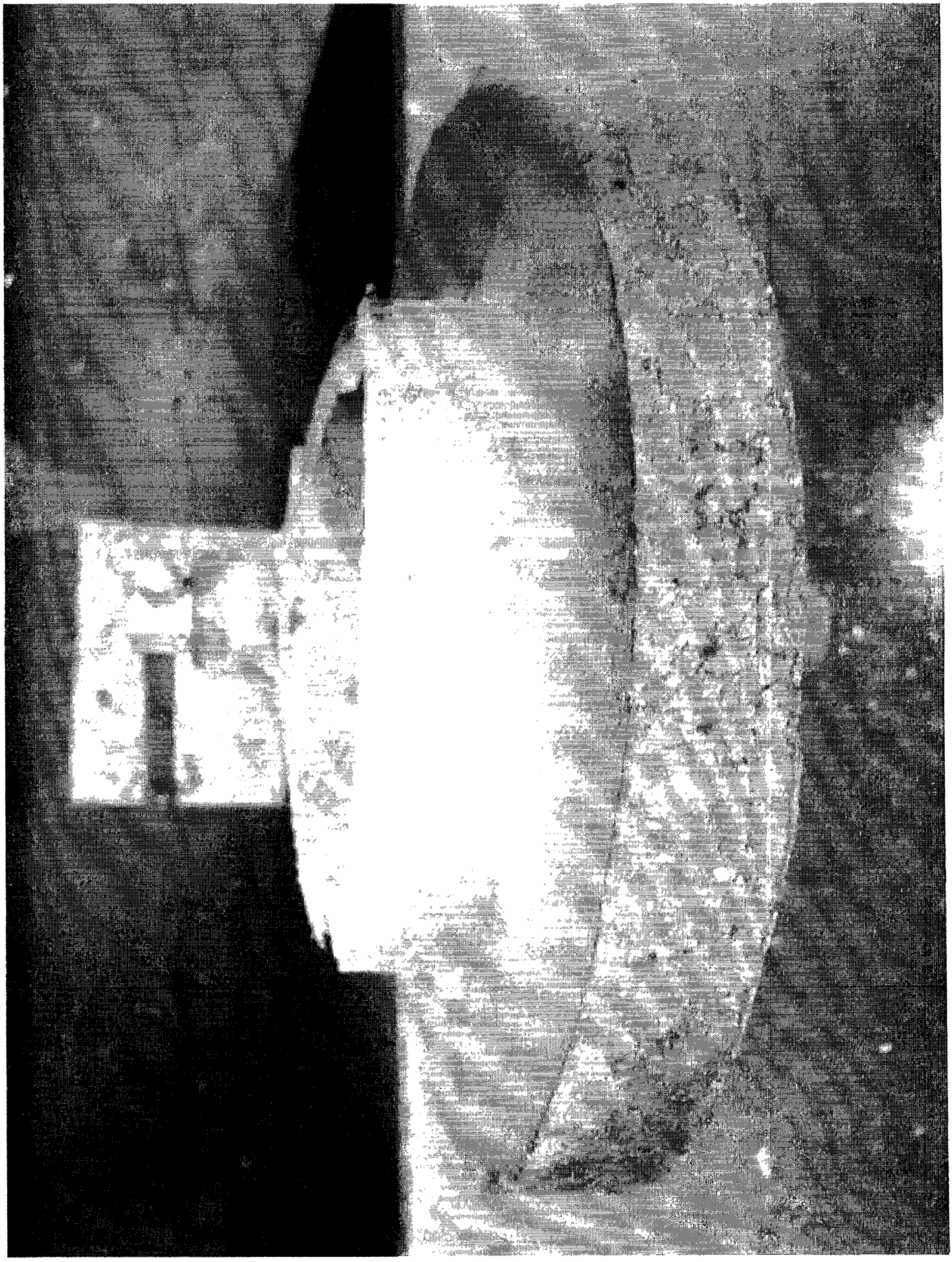


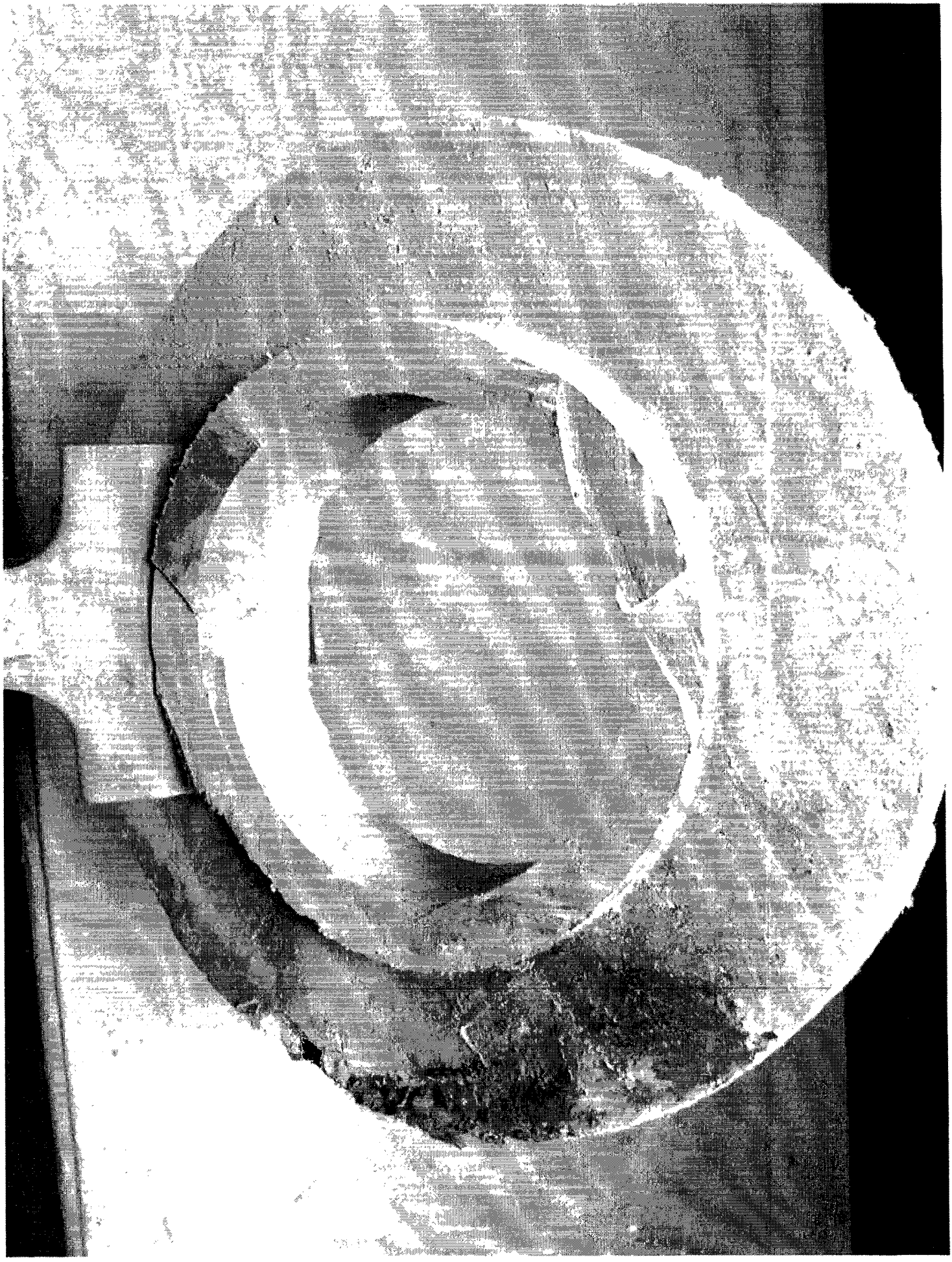


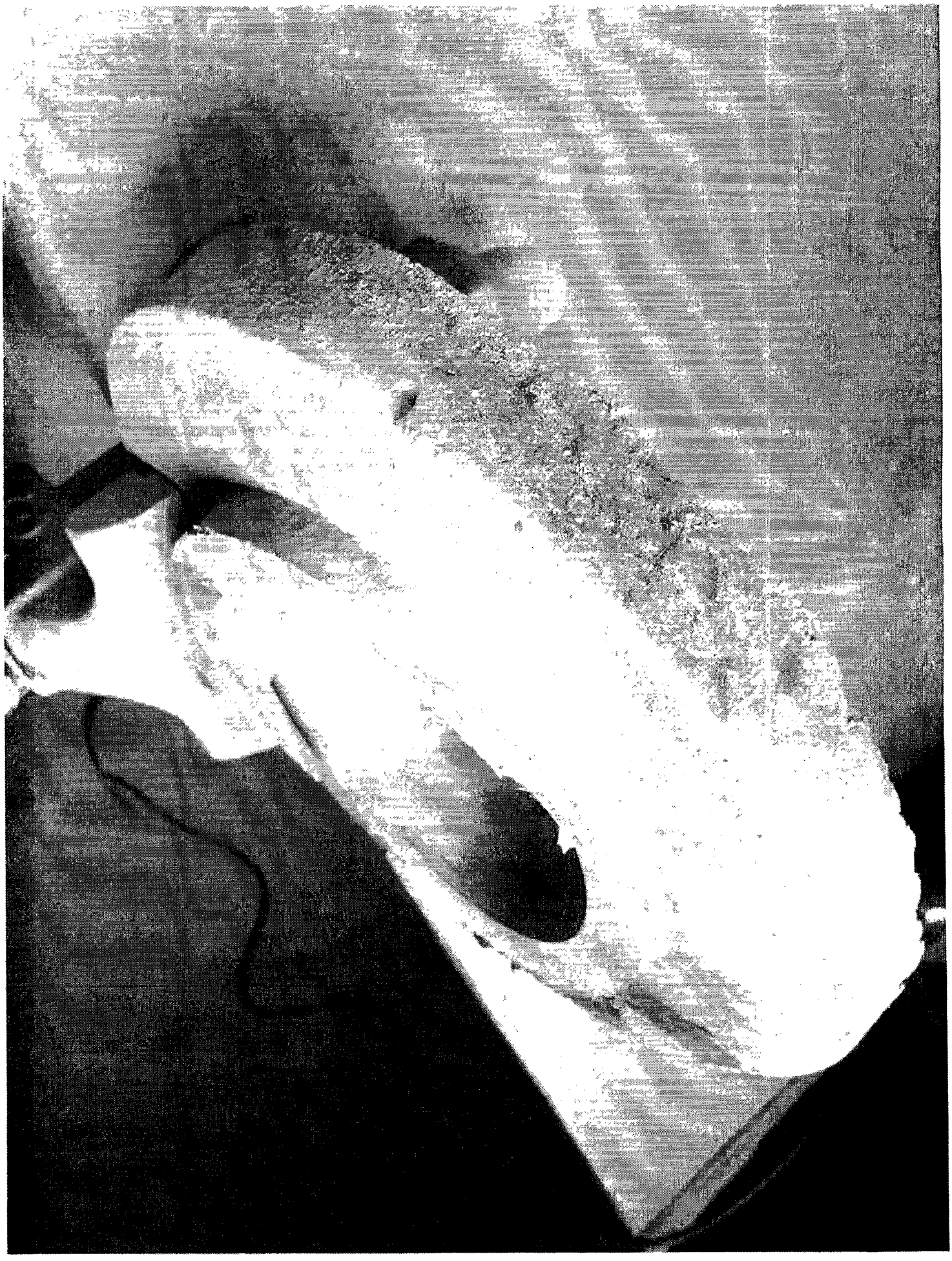






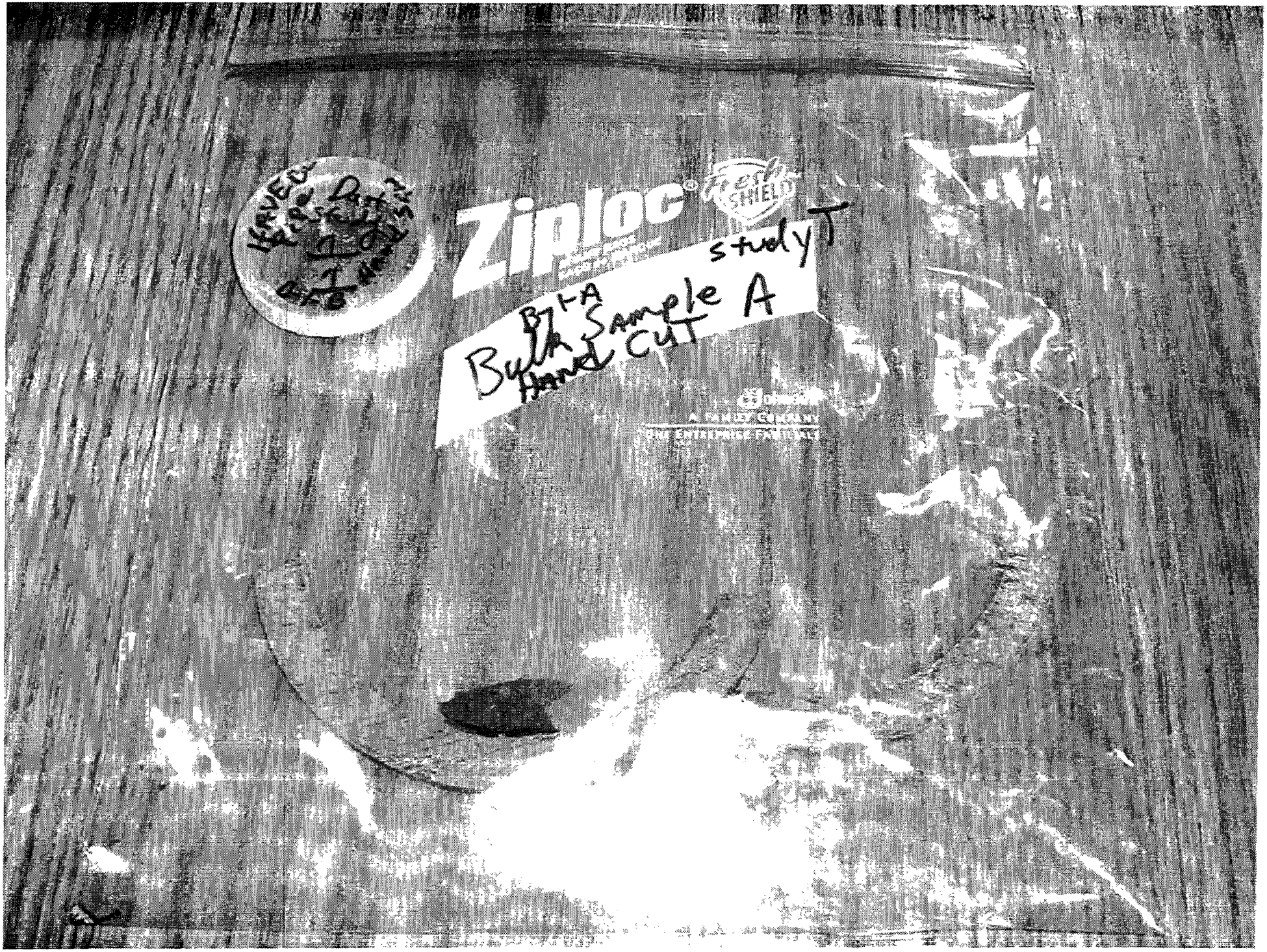






B-3-B
Study 3
HAVEG
Bulk
Study 2 A
B-3-A
Study 3
Haveg

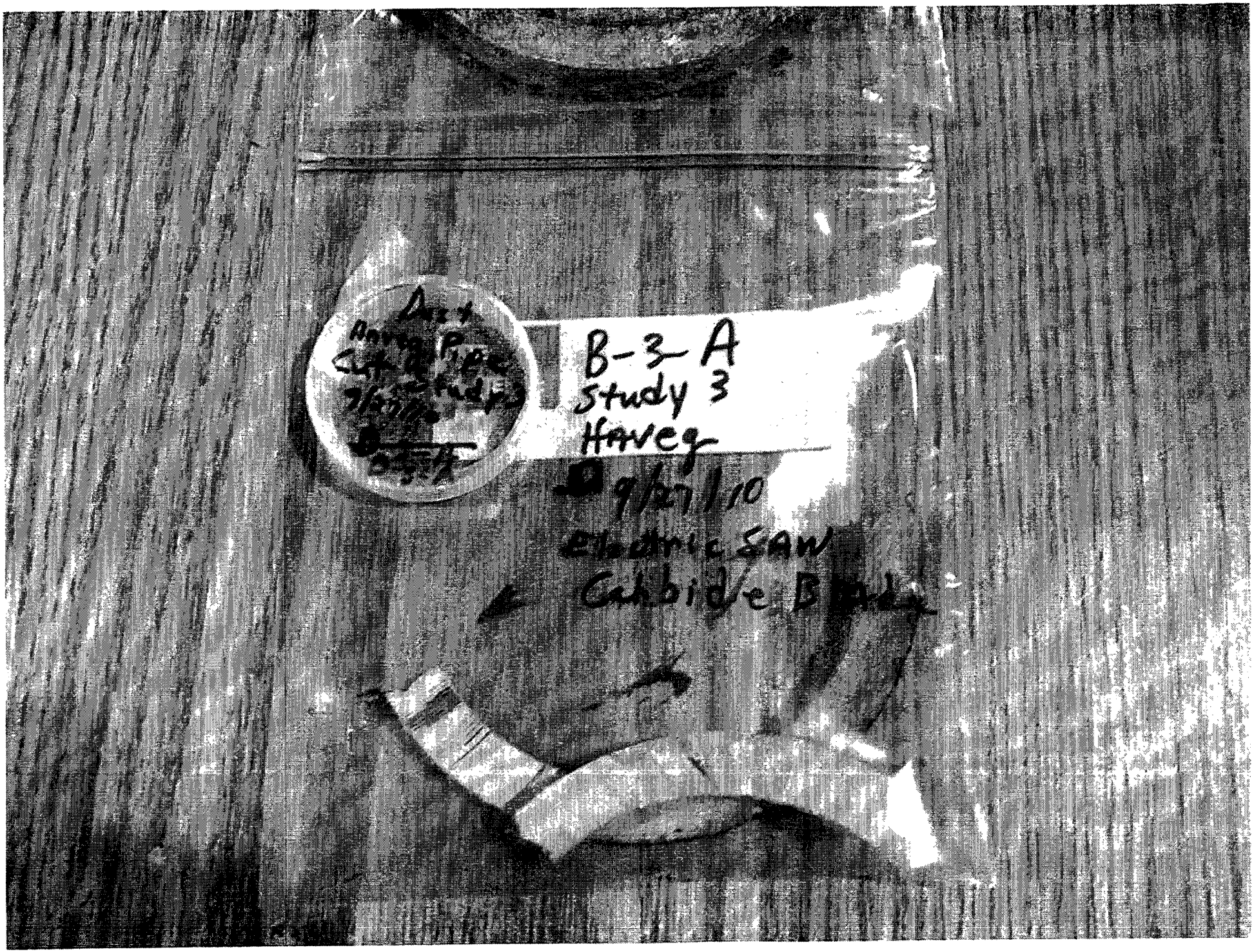

Study 3
Bulk Sample A
By Hand Cut
Study 2
B-2-B
Hang Pipe Cut
Electric Saw
Steel Plate
Bulk Study 2
B-2-A
B-3-A
Study 3
Hang
Electric Saw
B-3-B
Study 3


Ziploc
SHIELD
Bulk Sample A
Bulk Hand Cut
study T
A FAMILY COMPANY


Build comp 1c
Study 1
B-1-B


0-2-A
Bulk study 2
Sample 2A


Study 2
B-2- B
Heavy Pipe Cut
Electric Saw
Steel Blade


B-3 A
Study 3
Haveg
9/27/10
Electric Saw
Carbide Blade

B-S-B
Study
HAVEG