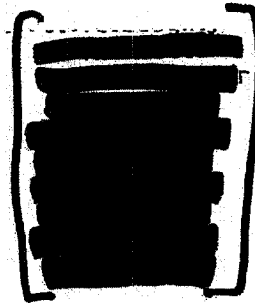


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RECYCLED



August 11, 1983

PERSONAL AND CONFIDENTIAL

TO: T. M. KEMP.

FROM: J. G. LOSCHIAVO *J. G. L.*UPDATE ON THE C-8 BLOOD SAMPLING PROGRAM

An overall drop in blood C-8 levels is observed in TEFLON® Fine Powder/Dispersion and FEP Operators. This drop in blood C-8 levels is statistically significant. In Table 1, it can be noted that 16 out of 22 Fine Powder/Dispersion Operators experienced a drop in blood C-8 levels. An additional two Operators experienced no change. The four remaining Operators experienced increases.

In Table 2, it can be noted that 14 out of 15 FEP Operators experienced a drop in blood C-8 levels. The significant downward trends experienced by both groups of Operators are very encouraging.

Data on individuals who left TEFLON® indicate that the biological half-life of C-8 in the blood (i.e., the time it takes to reduce blood C-8 level by 50%) is approximately two years.

DISCUSSION

The attached Tables contain blood C-8 data for TEFLON® Fine Powder/Dispersion and FEP Operators. Blood C-8 data were obtained from the FLAIR (Fluoropolymers Laboratory Analysis Information Retrieval) program. All blood samples were analyzed by the C-8 specific method. Data recorded in FLAIR up to 7/14/83 are included in this report. Only data on Operators who have worked in TEFLON® at least 730 days as of the first of the two listed sample dates are included since new Operators will experience increasing blood C-8 levels until an equilibrium level is reached.

AUGUST 11, 1983

Blood C-8 levels for Fine Powder/Dispersion Operators range from 1.1 ppm to 25.0 ppm and average 5.5 ppm (see Table 1). These Operators experienced an overall 13% drop in blood C-8 levels over the past two years. Blood C-8 levels for FEP Operators range from 0.36 ppm to 3.7 ppm and average 1.2 ppm (see Table 2). These Operators experienced an overall 14% drop in blood C-8 levels over the past two years.

A paired-t test was performed on the blood C-8 data to determine if the blood C-8 decrease experienced by most of the Operators is statistically significant. As a result, the decreases were found to be statistically significant at the $p = 0.05$ level. These significant blood C-8 reductions are no doubt due to efforts made by TEFLON® Copolymers and Polymers business teams to reduce C-8 in air levels.

Although many of the Fine Powder/Dispersion Operators are experiencing blood C-8 decreases, there are four Operators whose blood C-8 levels have increased. Interestingly, all four Operators are involved with weighing C-8 in the ingredients hood. Levels of C-8 in air outside this hood have been found to exceed the AEL. Two samples recently collected in this area were analyzed at 0.79 mpb and 0.84 mpb. Housekeeping and work habits in this area are less than adequate. A large amount of powder was observed around the outside of the hood. For this reason, it's recommended that work habits be improved and Safety and Health Rules involving the weighing of C-8 be reviewed with all employees concerned, namely Autoclave Operators and Dispersion Processors. It's also recommended that a liquid C-8 solution be considered as a replacement for the C-8 powder.

Blood C-8 data were obtained on five individuals who left TEFLON® due to transfer or retirement (see Table 3). Data on these individuals indicate that on the average it takes approximately two years to reduce blood C-8 levels by 50%. This is called the biological half-life.

JGL:sdg

Attachments

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TABLE 1

TEFLON® FINE POWDER/DISPERSION OPERATORSC-8 BLOOD SAMPLE RESULTS

<u>DATE OF FIRST SAMPLE</u>	<u>C-8 IN BLOOD (PPM)</u>	<u>DAYS IN JOB AT SAMPLE DATE</u>	<u>DATE OF SECOND SAMPLE</u>	<u>C-8 IN BLOOD (PPM)</u>	<u>DAYS IN JOB AT SAMPLE DATE</u>
1/14/82	26.0	9,358	1/12/83	20.0	9,721
2/18/82	24.0	2,332	2/17/83	25.0	2,696
10/8/81	11.0	9,260	11/3/82	8.2	9,651
8/7/81	9.4	2,379	8/6/82	7.9	2,743
10/1/81	8.2	5,813	9/29/82	6.5	6,176
2/11/82	7.0	1,989	2/10/83	7.7	2,353
8/12/81	6.9	1,743	7/15/82	5.9	2,080
4/2/82	5.6	8,311	3/2/83	4.2	8,645
1/7/82	4.4	5,765	1/7/83	4.9	6,130
4/6/81	4.3	857	5/12/82	5.6	1,258
3/11/82	3.9	800	3/10/83	3.6	1,164
12/30/81	3.6	962	12/27/82	2.7	1,324
8/19/81	3.5	871	8/17/82	2.1	1,234
3/26/82	2.9	8,242	3/18/83	2.8	8,599
12/2/81	2.8	2,256	12/2/82	2.8	2,621
3/11/82	2.6	1,621	4/6/83	2.4	2,012
7/16/81	2.5	5,652	6/17/82	1.8	5,988
7/16/81	2.5	1,705	6/30/82	2.5	2,054
4/6/81	2.1	918	1/19/82	1.6	1,206
3/3/82	1.6	5,880	3/22/83	1.5	6,264
2/9/82	1.5	770	2/10/83	1.2	1,136
10/9/81	1.3	1,803	10/6/82	1.1	2,165

 $\bar{X} = 6.3$ ppm $\bar{X} = 5.5$ ppm

16 out of 22 employees experienced decreased blood C-8 levels.
 2 out of 22 employees experienced no change in blood C-8 levels.
 4 out of 22 employees experienced increased blood C-8 levels.

Decrease in C-8 in blood levels is statistically significant at $p = 0.05$ level.

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TABLE 2
TEFLON® FEP OPERATORS
C-8 BLOOD SAMPLE RESULTS

<u>DATE OF FIRST SAMPLE</u>	<u>C-8 IN BLOOD (PPM)</u>	<u>DAYS IN JOB AT SAMPLE DATE</u>	<u>DATE OF SECOND SAMPLE</u>	<u>C-8 IN BLOOD (PPM)</u>	<u>DAYS IN JOB AT SAMPLE DATE</u>
4/7/81	4.5	1,284	4/22/82	3.7	1,664
2/2/82	3.1	9,438	2/21/83	2.8	9,822
4/15/82	2.1	8,917	4/14/83	1.5	9,281
1/27/82	1.8	9,249	1/26/83	1.1	9,613
12/16/81	1.8	1,977	1/12/83	1.6	2,369
4/7/81	1.7	827	9/15/82	1.4	1,353
4/21/81	1.25	732	10/9/81	1.20	903
3/31/82	0.95	5,813	4/26/83	0.79	6,204
10/28/81	0.86	899	5/16/83	0.75	1,464
10/15/81	0.75	1,807	10/14/82	0.72	2,171
3/17/82	0.52	5,417	3/17/83	0.44	5,782
8/26/81	0.51	891	7/29/82	0.48	1,228
2/25/82	0.42	2,387	5/16/83	0.39	2,832
8/28/81	0.41	861	8/26/82	0.46	1,224
10/28/81	0.38	1,927	10/26/82	0.36	2,290

$\bar{X} = 1.4$ ppm

$\bar{X} = 1.2$ ppm

14/15 employees experienced decreased blood C-8 levels.

Decrease in C-8 in blood levels is statistically significant at $p = 0.05$ level.

TABLE 3

EMPLOYEES WHO LEFT TEFLON® JOBS

<u>C-8 IN BLOOD WHEN LEFT TEFLON® (PPM)</u>	<u>C-8 IN BLOOD AT A LATER DATE (PPM)</u>	<u>DAYS ELAPSED BETWEEN SAMPLES</u>	<u>REASON FOR LEAVING TEFLON®</u>
19.0	16.0	128	Retired from Company
3.8	2.2	780	Retired from Company
2.1	2.2*	333	Retired from Company
0.57	0.14	730	Transferred to another WW Division
0.14	0.08	759	Transferred to another WW Division

*This 5% increase in C-8 blood levels is likely due to analytical error and will be considered as a 0% drop in blood C-8.

Biological half-life of C-8 in blood based on these 5 data points is 2.1 years.