

2

AR 226 - 1386



E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED

WILMINGTON, DELAWARE 19898

POLYMER PRODUCTS DEPARTMENT
EXPERIMENTAL STATION

PERSONAL AND CONFIDENTIAL

May 14, 1981

TO: DR. Y. L. POWER - PPD, Washington Works

FROM: S. S. STAFFORD *S. S. Stafford*

ANALYSIS OF BLOOD SAMPLES FOR PERFLUOROOCTANOATE
(Job No. 810-190; PRAL Nos. 81-1420-81-1467; Notebook Nos. E22514, E26238)

As requested in your letter of 4/8/81 to L. J. Papa, the 48 blood samples submitted then have been analyzed for perfluorooctanoate (C_8). Results and sample identification are given in the attached table.

As noted there, the analysis was done using a gas chromatographic method specific for C_8 (Lab Method Number ES-567) but results have been reported as ppm F for comparison with total organic fluorine analyses. Precision is $\pm 10\%$ relative standard deviation over most of the concentration range, somewhat less at the lowest values. The lower limit for quantitation is 0.007 ppm F (0.01 ppm perfluorooctanoic acid), with a detection limit of ~ 0.004 ppm which can be distinguished from the reagent background but not well quantitated.

Please contact me (772-4440) or L. J. Papa (772-2745) if you have any questions regarding the analyses. General questions on blood sampling can be directed to J. W. Raines or L. F. Percival.

Attachment
jah

KeyWords:
Perfluorooctanoic Acid
Perfluorooctanoate
Blood Analysis
GC

000154

TABLE I

CONCENTRATION OF PERFLUOROOCTANOATE IN BLOOD (a)

<u>Sample</u>				<u>GC Analysis</u>	
<u>PRAL No.</u>	<u>Date Sampled</u>	<u>P.R.No.</u>	<u>Name</u>	<u>Date Analyzed</u>	<u>[C₈], µg F/g blood^(b)</u>
81-1420	4/1/81			4/11/81	0.078
				4/15/81	0.074
81-1421	4/1/81			4/11/81	1.5
81-1422	4/2/81			4/11/81	0.013
81-1423	4/2/81			4/11/81	0.048
81-1424	4/3/81			4/11/81	0.62
81-1425	4/3/81			4/13/81	0.13
81-1426	4/6/81			4/13/81	0.072
81-1427	4/6/81			4/13/81	0.051
81-1428	4/6/81			4/13/81	0.11
81-1429	4/6/81			4/13/81	0.061
81-1430	4/6/81			4/13/81	0.19
81-1431	4/6/81			4/13/81	1.0
81-1432	4/6/81			4/14/81	5.1
81-1433	4/6/81			4/15/81	0.44
81-1434	4/6/81			4/13/81	0.052
81-2435	4/6/81			4/14/81	0.23
81-1436	4/6/81			4/14/81	0.11
81-1437	4/6/81			4/14/81	0.17
81-1438	4/6/81			4/13/81	0.31
81-1439	4/6/81			4/14/81	0.054
81-1440	4/6/81			4/14/81	0.077
81-1441	4/6/81			4/15/81	0.31
81-1442	4/6/81			4/24/81	4.3
81-1443	4/6/81			4/14/81	0.64
81-1444	4/6/81			4/15/81	1.3
81-1445	4/6/81			4/15/81	0.14
81-1446	4/6/81			4/16/81	0.57
81-1447	4/6/81			4/16/81	0.18
81-1448	4/6/81			4/16/81	0.15
81-1449	4/6/81			4/16/81	0.83
81-1450	4/6/81			4/18/81	3.8
81-1451	4/6/81			4/16/81	0.22 (c)

000155

EID713272

TABLE I (CONT'D)

CONCENTRATION OF PERFLUOROOCTANOATE IN BLOOD (a)

Sample				GC Analysis	
PRAL NO.	Date Sampled	P.R.No.	Name	Date Analyzed	[C ₈], $\mu\text{g F/g blood}$ ^(b)
81-1452	4/6/81			4/16/81	0.019
81-1453	4/6/81			4/18/81	0.11
81-1454	4/6/81			4/18/81	0.14
81-1455	4/6/81			4/18/81	2.1
81-1456	4/6/81			4/18/81	0.19
81-1457	4/6/81			4/18/81	4.3
81-1458	4/7/81			4/20/81	4.5
81-1459	4/7/81			4/20/81	0.81
81-1460	4/7/81			4/23/81	1.7
81-1461	4/7/81			4/20 & 4/24/81	4.5
81-1462	4/7/81			4/20/81	1.9
81-1463	4/7/81			4/23/81	2.4
81-1464	4/7/81			4/20/81	0.10
81-1465	4/7/81			4/20/81	0.47
81-1466	4/7/81			4/24/81	3.6
81-1467	4/7/81			4/20/81	0.092

- (a) Analysis as described in Lab Method ES-567 ("Determination of Perfluorooctanoic Acid in Blood, Gas Chromatographic Method", S. Stafford, 4/3/81), using the packed column GC analysis with perfluoro-n-octanoic acid as calibration standard.
- (b) Although the analysis is specifically for perfluorooctanoate (acid or salts), concentrations are given in ppm fluorine for comparison with the results of total organic fluorine analyses. ($\text{ppm F} = 0.688 \times \text{ppm perfluorooctanoic acid}$) Estimated uncertainty is $\pm 10\%$ relative standard deviation. The lower limit for quantitation is $0.007 \mu\text{gF/g}$. The detection limit is $\sim 0.004 \mu\text{gF/g}$, but concentrations in that range cannot be well quantitated and are reported as < 0.007 . "None detected" is reported for samples with $[\text{C}_8] \lesssim 0.004 \text{ ppm}$, which cannot be distinguished from reagent background.
- (c) In GC analysis of this sample one unusual large peak was observed in the region of interest, but no interference with the C_8 peak was apparent.

000156

EID713273