

STABILITY IN WATER (HYDROLYSIS)

TEST SUBSTANCE

Identity: Perfluorooctanoic acid, ammonium salt; may also be referred to as PFOA ammonium salt, Ammonium perfluorooctanoate, FC-116, FC-126, FC-169, or FC-143. (Octanoic acid, pentadecafluoro-, ammonium salt, CAS# 3825-26-1).

Remarks: 3M production lot number was 332. Test substance is a white powder at 25°C.

METHOD

Method: Based on OPPTS: 835.2110
GLP (Y/N): No, but many GLP procedures followed.
Year completed: 2001
Type: Hydrolysis as a function of pH

Test sample preparation: Test solutions consisted of 1.0 mL of buffered aqueous solutions at six pH levels (1.5, 3.0, 5.0, 7.0, 9.0, and 11.0). The PFOA concentration in all test samples (sample duplicates and matrix spike samples) was approximately 5154 µg/L. Samples were shielded from light during incubation at 50° for periods of 0 to 109 days. Control samples and blanks addressed potential non-hydrolytic degradation routes.

Analytical Procedures: All samples were analyzed using HPLC/MS.

Remarks: This study was conducted at 50°C in order to facilitate hydrolysis. Rates measured at 50°C were extrapolated to 25°C by dividing by a factor of 10, which is valid for reactions with Arrhenius heats of activation near 18 kcal/mole.

RESULTS

Breakdown products: Not applicable.

Degradation: The analytical results for pH = 3.0 and pH = 11.0 failed to meet the data quality objectives and were rejected. Data from the remaining four pH levels indicate a small, pH-independent loss of PFOA. Pooled over pH levels, the measured PFOA concentrations provide the following two estimates of the pseudo-first order hydrolytic half-life of PFOA.

RESULTS (Continued)

Analytical Method/Quantities Employed	Hydrolytic Half-Life at 25°C (years)
Least Squares Log-Concentration Slope Estimate	≥ 92
Concentration Mean and Standard Deviation	≥ 97

CONCLUSIONS

Based on the experimental data, the hydrolytic half-life of PFOA is estimated to be greater than 92 years at environmentally relevant conditions.

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DATA QUALITY

Reliability: Klimisch ranking: 2

Remarks: Study was well conducted, though not under GLP.

REFERENCES

This study was conducted at the 3M Environmental Laboratory under Lab Request Number E00-1851. See 3M Environmental Laboratory Report No. E00-1851 (dated March 30, 2001).

OTHER

Last Changed: June 21, 2001