

WATER SOLUBILITY IN NATURAL SEAWATER AND 3.5% SODIUM CHLORIDE SOLUTION – SHAKE FLASK METHOD

TEST SUBSTANCE

Identity: Perfluorooctanesulfonate; may also be referred to as PFOS or FC-95. (1-Octanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-, potassium salt, CAS # 2795-39-3)

Remarks: The test substance is a white powder. Sample was re-crystallized from a production lot of FC-95, and assigned a test, control, and reference number TCR 00017-046. Purity determined to be 97.9% by LC/MS, ¹H-HMR, ¹⁹F-NMR and elemental analyses techniques.

METHOD

Method: Based on OECD 105, OPPTS 830.7840.

GLP (Y/N): Yes

Year completed: 2001

Water Sources:

Natural Seawater = Ocean Scientific, lot # LN 58, salinity = 3.5%

Sodium Chloride = EM Science, 99% pure, mixed with ASTM

Type I water to achieve salinity of 3.5%

Remarks: The definitive test consisted of placing an excess amount of test substance with the appropriate water in centrifuge tubes. The tubes were vortexed and shaken at 150 rpm at 30°C for 24, 48 and 72-hours followed by 24-hours of equilibration at 22 - 24°C. Following equilibration, samples were centrifuged and the supernatant was analyzed by high performance liquid chromatography with mass spectrometric detection (LCMS).

RESULTS

Natural Seawater: 12.4 mg/L at 22 - 23°C

3.5% NaCl Solution: 20.0 mg/L at 22 - 24°C

Description of solubility: Slightly soluble.

The 24, 48, and 72-hour solubility concentrations were averaged to obtain the overall mean solubility concentrations for the natural seawater. The 24-hour values were not included in the mean solubility of sodium chloride

calculation because when the coefficient of variation was calculated for all of the replicate analyses for that day, it was > 15%.

CONCLUSIONS

The overall mean solubility concentration of the test substance in natural seawater it was 12.4 mg/L and in a 3.5% NaCl solution it was 20.0. PFOS solubility decreases with increasing ionic strength of the medium.

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DATA QUALITY

Reliability: Klimisch ranking 1.

REFERENCES

Studies conducted at the 3M Company, St Paul, MN, 2001, Environmental Laboratory Project Number EOO-1716.

OTHER

Last changed: 6/26/01