

PFAS in leaching eluate

Large-scale production of PFAS (per- and polyfluorinated alkyl substances) began in the 1950s and continues today. PFAS is easily spread in our environment, all the way down to the groundwater. Since PFAS has long-lived properties in combination with negative health effects on humans and animals, it is therefore of great importance to investigate the leaching properties of materials regarding PFAS.

Background

PFAS is a group of highly stable synthetically produced organic compounds, which are known to persist as “forever chemicals” once released into the environment.

Since PFAS compounds are stable at high temperatures, grease-repellent and water repellent, there are many PFAS applications. PFAS has been used to impregnate clothes and shoes, used in materials for food production, skin care products, cosmetics, car upholstery, firefighting foam, insulation in electronics, etc. This widespread use has led to pollution of waters and the environment in many places.

PFAS is associated with several negative health effects, e.g. thyroid, liver and fat metabolism can be affected. In addition, the hormonal system and immune system can be negatively affected by long-term exposure. Extensive PFAS research is ongoing.

Leaching

A major difference between PFAS and several other organic pollutants is that many of the PFAS substances have relatively high-water solubility, which is especially true for fluorinated sulfonates and acids.

Thus, it is relevant to investigate the leaching properties of the material regarding PFAS.



Assessment

The Swedish Environmental Protection Agency's regulation NFS 2004:10 lacks waste acceptance criteria (WAC) for several organic pollutants, including PFAS. For these parameters, the agency has produced the guidance “WAC for waste to landfill for parameters that do not have leaching criteria” (2017). There it's clarified that if the waste contains contaminants that do not have reception criteria, these must nevertheless be examined to assess whether the waste meets the requirement for the relevant landfill class, which includes leachability. For more information, see:

<https://www.naturvardsverket.se/vagledning-och-stod/avfall/deponering-av-avfall/>.

Order

To order leaching test combined with PFAS analysis, the delivery note called “**Delivery**

Note – Leaching test with subsequent PFAS analysis should be used. If other analyses are to be ordered, please use the regular delivery note for solid samples.

On the delivery note you choose the type of leaching test, PFAS package applied on leaching eluate and pretreatment of leaching eluate.

Type of leaching test:

Select which batch test to order, EN12457:1-3, in the scroll list:

Type of leaching test:
1-step batch L/S=2 (PSL01)
1-step batch L/S=10 (PSL02)
2-step batch L/S=2, L/S=8 (PSL03)

PFAS package applied on leaching eluate:

Select the scope of PFAS analyses.

PFAS package applied on leaching eluate:
PFAS 11 (PLWPL)
PFAS 21 (PLWLY)
PFAS 28 (PLW9M)
PFAS 35 (PLWXZ)
PFAS 11 (PLWPL) + TOP (PLWS6)
PFAS 21 (PLWLY) + TOP (PLWLU)
PFAS 28 (PLW9M) + TOP (PLWLU)
PFAS 35 (PLWXZ) + TOP (PLWLU)

For more details about the content, please see our online catalogue; <https://analyskatalog.eurofins.se/>.

Pretreatment of leaching eluate:

When conducting the batch test, the sample is mixed with water. Prior to analysis, the leachate is separated from the solid material. Select the desired separation technique.

Pretreatment of leaching eluate:
Sedimentation (LX00Y)
Sed.+centrifug. (LX00Y+LW1UQ)
Filtration 0,45 µm (LX00Z)

Sedimentation

The solid material is allowed to sediment to the bottom of the bottle, after which the liquid

phase is carefully decanted. Lighter particles may come along.

Sedimentation + centrifugation

The solid material is allowed to sink towards the bottom of the bottle. It is then further compressed by centrifugation, followed by decantation of the liquid phase. This methodology is particularly suitable for materials that easily absorb water and/or materials that do not settle easily.

Filtration

The sample is filtered through a particle filter, 0.45 µm, which means that particle-bound PFAS substances are filtered out and only the water-soluble fraction is analysed.

In general, a good yield is obtained after filtration for all PFAS < C10-C12, i.e. PFAS11 works well. Longer PFAS can also be analysed, but our general recommendation is to interpret these results with some caution.

Centrifugation is the usual procedure in leaching standards, e.g. EN14405, that include organic substances.

Reporting

When ordering 1-step batch, the sample is registered on two ID numbers:

Sample no. 1 – Sample preparation + leaching test
Sample no. 2 – Pretreatment of leaching eluate + PFAS package

When ordering 2-step batch, the sample is registered on three ID numbers:

Sample no. 1 – Sample preparation + leaching test
Sample no. 2 – Pretreatment of leaching eluate L/S 2 + PFAS package L/S 2.
Sample no. 3 – Pretreatment of leaching eluate L/S 8 + PFAS package L/S 8. L/S 10 is calculated by the client.

The unit for leached PFAS parameters is ng/l. A cost for sample preparation is added.

TAT is 15 working days for batch test.

If you have any questions about column testing, please contact us.