
***Environmental Risk Assessment of Surfactants, Management
A research partnership of the detergent and surfactant industries in Europe***

(final version adopted on 22.03.02)

ERASM Position on LAS

1. ERASM has demonstrated that LAS constitutes no adverse risk to the aquatic environment. This position has been supported by, amongst others, the Ministry of the Environment in the Netherlands. Furthermore, ERASM believes that LAS poses no undue environmental risks in any compartment.
2. Terrestrial risk assessment in Denmark has demonstrated that LAS constitutes no adverse risk to the terrestrial environment, when sewage sludge containing levels of LAS typical of European conditions are applied to soil.
3. The maximum levels of LAS, permitted in the Danish Executive Order are unnecessarily conservative when consideration is given to the ready aerobic biodegradability of LAS when sludge is aerobically stabilised or subjected to composting or used in agricultural soils.
4. Hence, ERASM considers that the discrimination against LAS on the basis of its anaerobic non-biodegradability is unwarranted and has demonstrated that anaerobic biodegradability is not a criterion which is of relevance for surfactants which are readily biodegraded aerobically under realistic conditions. (An ERASM report covering this aspect is available.)
5. ERASM acknowledges the need to address the sediment risk assessment and has therefore initiated a research program in this area.

Background

LAS is one of most used surfactants globally and very extensive investigations of its human and environmental safety data are available.

Surfactants first came under scrutiny by authorities due to foaming on rivers in the 1950s and 60s. Multiple branched alkylbenzene sulphonates which are not rapidly and completely biodegradable were implicated. Industry developed LAS, which is biodegraded well under most environmental conditions. However, LAS has remained the subject of attention.

The principal pathway to the environment for LAS is via discharges of sewage effluent. LAS is readily biodegradable and when subject to normal biological sewage treatment and dilution upon entry to the aquatic environment concentrations are very low. The comparison with the predicted no effect data allowed to conclude that LAS does not pose any significant risk to the aquatic environment.

This conclusion was confirmed through a co-operative risk assessment carried out by the Netherlands Ministry of Environment and Spatial Planning (VROM) and the Netherlands Soap and Detergent Industries Association (NVZ) in the mid 1990s.

LAS is not biodegraded in laboratory screening tests for anaerobic biodegradation using bio gas measurements. LAS can be found with digested sewage sludge in concentrations ranging from ~0.01 g/kg to < 30 g/kg. Similarly, LAS can be found in anaerobic zones within riverine, lacustrine and marine sediments in concentrations ranging from ~0.01 mg/kg to < 5 mg/kg. No detrimental effects have ever been correlated with an apparent lack of anaerobic biodegradation.¹

Mainly as a consequence of its apparent lack of anaerobic biodegradability in practice, it is excluded from detergent products under the Nordic Swan ecolabelling criteria as well as in the German Blue Angel, and it has been listed by Danish authorities as one of 100 unwanted chemicals. Furthermore, in Denmark, Danish Executive Order no. 823 (1996) set an initial limit for LAS in sewage sludge to be utilised in farmland of 2600 mg/ kg and required that the level of LAS must not exceed 1300 mg/kg dry matter after July 2000.

The Danish government set the original limits in the Executive Order on the basis of a calculation of a No Effect Level in soil from sludge applied to land. ERASM sponsored a research programme in Denmark, specifically to develop improved quality data to strengthen the assessment of LAS in the terrestrial environment. A workshop to evaluate the terrestrial environmental risk assessment was held in Copenhagen in April 1999. The fate and effects research by the Danish institutes VKI and DMU demonstrated that the risk of terrestrial toxicity of LAS in sludge-amended agricultural soils is negligible and unlikely to cause long-term adverse effects. The workshop concluded that a level of around 5.2 mg/kg LAS in soil constituted no adverse risk to the terrestrial environment, which would correspond to a limit value of > 15,000 mg/kg in sewage sludge (using the agreed methodology of the European Technical Guidance Documents for Risk Assessment). Nevertheless, the Danish Government refused to change the Executive Order, stressing that 'significant levels' of LAS had been detected in marine sediments². Criticism of products containing LAS increased, because the political goal of the Environment Ministry included adoption of the Nordic Swan by the detergents industry. Monitoring of marine sediments by industry has demonstrated that in highly polluted Danish fjords sediments may contain LAS and even branched alkylbenzene sulphonates from the 1960s. Other sites around European coastal waters show only very low, or non-detectable levels of LAS.

ERASM is currently carrying out a programme of work, which aims to provide the data to enable an assessment of any risks posed by LAS in freshwater and marine sediments. Results from this research are expected by end of 2002.

¹ ERASM report on the relevance of Anaerobic Biodegradation of Surfactants, (1999), Brussels.

² In some highly polluted sediments in Danish fjords concentrations of LAS around 25 mg/kg. The authorities have not been able to supply details.