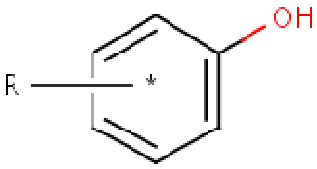
ALTERNATIVE ASSESSMENT – NONYLPHENOL ETHOXILATE

14 August 2013

Scope of assessment

Nonylphenol ethoxylates (various CAS number: 68412-54-4; 26027-38-3; 9016-45-9) are auxiliary chemicals used in different industries. They are good emulsifiers and wetting agents and have been used widely in textile and leather for cleaning purpose.

Nonylphenol (NP) is known to be a byproduct of nonylphenol ethoxylates (NPnEO) which are used as detergents in industry. It is important that not only NP but also NPnEO and their related substances are analysed when behaviour of NP in the wastewater treatment process is surveyed. NPnEO are biodegraded to shorter ethoxylate (EO) chain NPnEO or nonylphenol carboxylates (NPnEC) under aerobic conditions, and then biodegraded to NP under anaerobic conditions. NP is one of the suspected endocrine disruptors (ED).



Currently this compound is included in the entry 46 of Annex XVII of the REACH Regulation, with the limitation that can not be used by more than 0.1% in the treatment process of textiles.

Hazard assessment

The substituted substance is on the "hazardous substances database according to SUBSPORT screening criteria" (SDSC) since it is listed PBT on the OSPAR list of substances of possible concern and as an EDC in the EU commission database of potential endocrine disruptors (category 1) and on the SIN List. The alternative substance has no CLP classification and is not listed on the SDSC

Link: http://www.subsport.eu/listoflists?listid=31

Nonylphenol is a mixture of isomeric monoalkyl phenols, predominately para substituted, found in the environment primarily as a biodegradation product of nonylphenol ethoxylates. Nonylphenol production and use as a non-ionic surfactant lube oil additive, fungicide, and antioxidant for polymers may result in its release to the environment through various waste streams. Nonylphenol is mostly an environmental health issue for aquatic organisms.

Substitution description

Nonylphenols are industrial surfactants and detergents, widespread in use for more than 40 years, and are added to hundreds of industrial and consumer products for carpet and dry cleaning, pesticides, paper manufacturing, paints and coatings (Dow Chemical 1995-2006). Common exposure to nonylphenol sources for the general population is via cosmetics, household cleaners and paints.

Degreasers based on Oxirane, 2-methyl-, polymer with oxirane, mono(2-propylheptyl) ether, have excellent wetting and emulsifying properties that are not affected by pH. The degreaser is low foaming and is miscible with water in practically all proportions. The low viscosity allows pumping.

Dodecyl alcohol, ethoxylated degreasers, generally have a higher viscosity but they have good wetting and dispersing properties. For example:

Polyoxyethylene alkyl ether

CAS No. 9002-92-0

CE ELINCS: 500-002-6

Polyoxyethylene tridecyl ether

CAS No. 24938-91-8

Alcohols, C10-16, ethoxylated

CAS No. 68002-97-1

CE ELINCS: 500-182-6

For more information:

http://www.subsport.eu/wp-content/uploads/2013/07/nonylphenol.pdf

Case/substitution evaluation

This case story describes the substitution of a nonylphenolethoxylate substance which is included in the SDSC-list as well as several other lists because of its endocrine disrupting category 1- and PBT-properties. The alternative substance has none of these properties and should therefore be a better alternative.

The complete elimination of the use of this compound presents important environmental benefits; this product should be used with high degree of biodegradability. The current alternatives offer the complete replacement of the product pollution, in addition to being reflected in the sale as environmentally correct products.

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Figure: Assessment methodology