

BIODEGRADABILITY Fatty acids, C8-18 and C18-unsatd., mixed esters with C18-unsatd. fatty acid dimers, decanoic acid, octanoic acid and trimethylolpropane (CASRN: 2411231-33-7)

The Polyol Ester category members are considered to be readily biodegradable according to the OECD criteria. The category members are thus expected to be rapidly degraded by microorganisms in both the aquatic and terrestrial environments.

Since no studies investigating the ready biodegradability of Fatty acids, C8-18 and C18-unsatd., mixed esters with C18-unsatd. fatty acid dimers, decanoic acid, octanoic acid and trimethylolpropane (CASRN: 2411231-33-7) are available a read across to the structurally related category members fatty acids, C16-18 (even numbered) and C16-18-unsatd. (even numbered), triesters with trimethylolpropane (CAS 68002-79-9), Fatty acids, C6-18, triesters with trimethylolpropane (CAS 91050-88-3), Fatty acids, C8-10, triesters with trimethylolpropane (CAS 91050-89-4) and 2,2-bis[[[1-oxoisooctadecyl)oxy]methyl]-1,3-propanediyl bis(isooctadecanoate) (CAS 62125-22-8) can be conducted.

The read-across substances are representative to evaluate the biodegradation Fatty acids, C8-18 and C18-unsatd., mixed esters with C18-unsatd. fatty acid dimers, decanoic acid, octanoic acid and trimethylolpropane (CASRN: 2411231-33-7) since they have a similar structure (C18 unsatd. and branched (source) compared to C16-18 and C18 unsatd. linear and branched) and thus cover the target substance adequately.

The first study with the read-across substance fatty acids, C16-18 (even numbered) and C16-18-unsatd. (even numbered), triesters with trimethylolpropane (CAS 68002-79-9) was performed according to OECD 301F (Manometric Respirometry) with sewage effluent as inoculum (Börner, 2000). After 28 d a biodegradation of 86% (O₂ consumption) was observed and the 10-day window was fulfilled. Thus, the substance is readily biodegradable according to the OECD criteria.

The second study with the read-across substance Fatty acids, C6-18, triesters with trimethylolpropane (CAS 91050-88-3) was conducted according to OECD guideline 301B using domestic activated sludge as inoculum. At test termination after 28 days the test substance was degraded by 62.9%, not fulfilling the 10-day window (Muckle, 2008). As the test substance is a mixture of constituents with different chain-lengths (UVCB), sequential (instead of concurrent) biodegradation takes place and the 10-day-window should not be considered for this UVCB substance. Thus, the test substance is readily biodegradable according to OECD criteria.

The third study with the read-across substance Fatty acids, C8-10, triesters with trimethylolpropane (CAS 91050-89-4) was conducted according to EU Method C.4-D using non-adapted effluent from a domestic sewage treatment plant as inoculum (Wierich, 2000). After 28 d the test item was degraded to 78% (O₂ consumption) and the 10-day window was fulfilled. Thus, the test substance is readily biodegradable according to the OECD criteria.

The fourth study with the read-across substance 2,2-bis[[[1-oxoisooctadecyl)oxy]methyl]-1,3-propanediyl bis(isooctadecanoate) (CAS 62125-22-8) was conducted under aerobic conditions according to OECD 301B using non-adapted activated sludge as inoculum (Desmares-Koopmans, 1997). A test concentration of 15.5 – 15.6 mg/L was applied. Based on CO₂ evolution a biodegradation of 66.7 – 73.3% was observed after 29 days. For substances with different chain lengths the 10-day window should not be used for the interpretation of results. It is possible that a sequential biodegradation occurred which might have resulted in a prolonged lag-Phase and therefore a slower biodegradation period, although the test substance was biodegraded in a large amount after the test duration. In this case the pass level can be applied after 28 days and therefore the test substance is considered to be readily biodegradable.

Based on the results from structurally related read-across substances it can be concluded Fatty acids, C8-18 and C18-unsatd., mixed esters with C18-unsatd. fatty acid dimers, decanoic acid, octanoic acid and trimethylolpropane (CASRN: 2411231-33-7) is readily biodegradable according to the OECD criteria.

ECHA European Chemicals Agency (2007-2020) Registered substances factsheets. Retrieved from <https://www.echa.europa.eu/registration-dossier/-/registered-dossier/18862/2/1>.