

Soil Adsorption and Desorption of SKYBIO

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The majority of the SKYBIO will be used in the treatment of water in food processing plants, swimming pools and cooling towers, in the manufacture fabric softeners in Australia. Most will eventually be released into domestic sewage system as a consequence of product use.

The SKYBIO is not readily biodegradable (0% over 28 days), and is expected to have a low partition coefficient and high water solubility (285 g/L), all indicating that the material would be mobile in both aquatic and terrestrial compartment. The PEC/PNEC ratio for the aquatic environment is 56. This value is significantly greater than 1, indicating an immediate concern to the aquatic compartment. However as a consequence of it's cationic character, the SKYBIO will be expected to associate to negatively charged organic matter in soil and sediment.

Therefore, the adsorption/desorption study was performed based on OECD guideline 106C. The detection limit of the test substance quantified by a spectroscopic method using Eosin indicator was 0.25 ppm. The adsorption percent was 95.2% for all three test soils. The desorption percent from the adsorbed soil were 4.5, 4.7 and 4.7%. As a result of the experiment, the adsorption coefficients(K) were 110, 111 and 116. The adsorption coefficient calculated as a function of the organic carbon content(Koc) of the test soils were 9,181, 11,100, and 8,942. And the SKYBIO could be concluded as a substance of medium or high adsorption(> 25%) and poorly desorption(<75%) in soil media. Therefore, this chemical is likely to be retained in soil media.

The PEC/PNEC ratio for aquatic environment calculated from the result of adsorption/desorption study is 0.0063. On the basis of this value the SKYBIO is not expected to pose a risk in aquatic environment.