eurofins

1,4-DIOXANE IN CLEANING & COSMETIC PRODUCTS

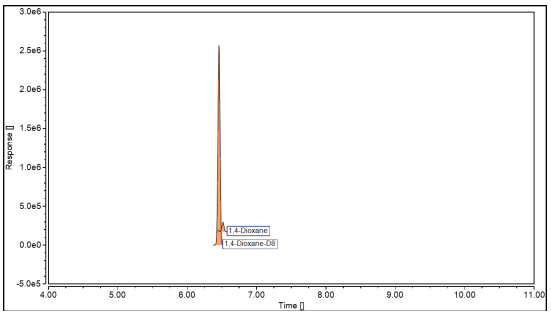
BY GC-MSMS (TKF39/TKF40)

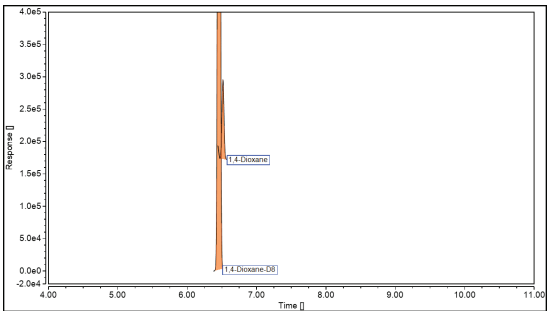
According to the FDA, 1,4-Dioxane ($C_4H_8O_2$) is a potential human carcinogen that forms as a byproduct during the manufacturing of ingredients such as emulsifiers, foaming agents, and detergents.[1] These ingredients are used in a variety of consumer goods, with prevalence in cosmetics such as shampoo, lotion, and makeup, along with household cleaning agents such as laundry detergent, multi-surface cleaning sprays, and more. The FDA has surveyed 1,4-Dioxane levels several times since the 1970s, most recently in 2018 when some products still tested with levels >10 ppm.[1] Though there is no federal limit on 1,4-Dioxane in these products, some states are now implementing their own. In New York State, cosmetics can have levels of no more than 10 ppm, and household cleaning and personal care products have a current limit of 2 ppm, which will be updated to 1 ppm at the end of 2023. To support compliance with these regulations, ESFA is now offering a validated GC-MSMS method for the analysis of 1,4-Dioxane in these products with a reporting limit of 1 ppm. The method has been validated for use in solids, surfactant-containing solids, liquids, surfactant-containing liquids, solvent-based liquids, and oil-based liquids.

How Does It Work?

ESFA scientists will prepare a solvent extract of your sample and inject it for analysis by Gas Chromatography Tandem Mass Spectroscopy (GC-MSMS). The instrument will use optimized voltages and conditions to detect 1,4-Dioxane based on its unique mass and fragmentation pattern. Sample levels will be compared to a standard curve and concentrations will be reported down to 1 ppm. Validated sample matrices include solids, surfactant-containing solids, liquids, surfactant-containing liquids, solvent-based liquids, and oil-based liquids. This includes products such as makeup liquids and powders, bar soap, shampoo, conditioner, lotion, cleaning sprays, laundry detergent, fabric softener, and essential oils. If you have a question about whether your product would fit into one of these categories, please contact us for more information.

See the method in action for a shampoo sample containing 1.97 ppm 1,4-Dioxane:





[1]1,4-Dioxanes in Cosmetics: A Manufacturing Byproduct. 03/03/2022.
https://www.fda.gov/cosmetics/potential -contaminants -cosmetics/14-dioxane-cosmetics-manufacturing-byproduct