

Identification and quantification of marine siderophores using high-performance liquid chromatography with electrospray ionization mass spectrometry

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Siderophores are low-molecular-weight organic compounds (500 - 1500 Da) produced by heterotrophic bacteria and highly selective for Fe(III). These complexation of iron by siderophores has the potential to affect both the solubility and bioavailability of iron (III) in seawater. We have determined the ferrioxamine siderophores in the seawater samples from high latitude North Atlantic Ocean. The identification and quantification of this siderophore type chelate was done by using recently developed high-performance liquid chromatography-mass spectrometry methods. Five different siderophore type chelates were detected and the compounds comprised of two groups; ferrioxamines and amphibactins group. In the dissolved phase, three types of hydroxamate siderophore have been identified; Ferrioxamine B (FOB), Ferrioxamine G (FOG) and ferrioxamine E (FOE). Concentration of dissolved FOB, FOG and FOE are extremely low between 0–135 x 10⁻¹⁸ M. Our present data indicated the presence of low concentrations of dissolved siderophores in the high latitude of the Atlantic Ocean and suggest that siderophore distributions are both spatially and temporally variable.