Dissolved Fe III speciation at tropical coastal water (S?) : in case of Northeast monsoon effect

ABSTRACT

The distribution of total dissolved iron (dFe) and natural organic Fe (III) binding ligands (FeL) were determined in the east coast of Peninsular Malaysia. This study was carried out during the pre- (October 2015) and post- (April 2016) of Northeast Monsoon. Seawater samples were analyzed by using a competitive ligand equilibration–adsorptive cathodic stripping voltammetry method. The [dFe] in October 2015 (3.0–25.0 nM) was lower than in April 2016 (40.4–940.4 nM) due to a longer Northeast Monsoon 2015/2016 period. We recorded a similar distribution of [FeL] to those [dFe]. In October 2015, its concentration was 4.2-25.8 nM, which was lower than in April 2016 (43.3-948.6 nM). However, the speciation data shows that the distribution of [FeL]/[dFe] ratio and Log K value were slightly similar during the two seasons. This indicated that [FeL] was always in excess of [dFe] and the presence of high stability of organic ligands class (L1: Log K13). Our present results suggested that the Northeast monsoon system results to the ligand saturation state in the water column, especially during the post-monsoon season. These organic ligands play an important role in Fe biogeochemistry cycle by binding any input of Fe (III) and remain it in the water column.

Keyword: Northeast monsoon; Organic ligands; Dissolved Fe; Speciation; Coastal water