Physico-chemical speciation of iron along the land sea continuum of the Iroise Sea

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As part of the FeLINE (Fer Ligands In the aulNe Estuary) project, we present the distribution of iron in the dissolved (DFe, 0.45µm) and soluble (SFe, 0.02µm) forms and porphyrins concentrations along the land sea continuum of the Iroise Sea. Samples were collected in October 2019 past a transect Aulne river and estuary/ Rade of Brest / Iroise Sea during low tidal coefficient (39). 20 casts were performed for which 12 parameters were collected and stored in addition to classical physicochemical constants (T°, S, pH, O_2). Iron and porphyrins concentrations were determined using flow injection analysis respectively with colorimetric detection method (Measures *et al*. 1995) and chemiluminescence detection (Vong *et al.* 2007). The first results showed the presence of a maximum turbidity zone (MTZ) around salinity 5 with the lowest pH values (7.3). DFe and SFe both showed a quasi-conservative behaviour in the estuary with concentrations gradually decreasing from freshwaters (DFe = 727.58 nmol/l, SFe = 60.02 nmol/l), to marine waters (DFe = 5.97 nmol/l, SFe = 4.07 nmol/l). A slight decrease was observed for salinities between 5 and 25, with highest lost from conservative behavior both for salinity 17 probably due to adsorption onto particulates and flocculation of these. SFe represents between 70 (S 35 – 30) and 20% (S 30-15) of the dissolved iron part in the most saline waters then this fraction diminishes to less than 10% in the river part, confirming a drift from the soluble part to the colloidal fraction. The porphyrins concentrations increased from 0.8 nmol/l (S= 0) to reach the highest concentrations of 0.988 nmol/l for S = 5.2, coinciding with the MTZ. Then it decreased slowly until 0.15 nmol/l for S= 34.9. Preliminary results of the iron and porphyrins behavior will be presented and discussed along the land sea continuum of the Iroise Sea.