



Physical and Chemical Speciation of Dissolved Iron in the Polar Oceans

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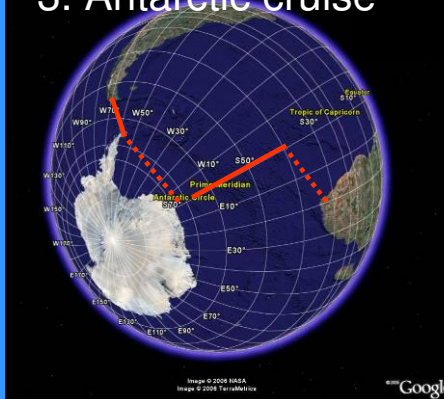
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2. Arctic cruise



3. Antarctic cruise

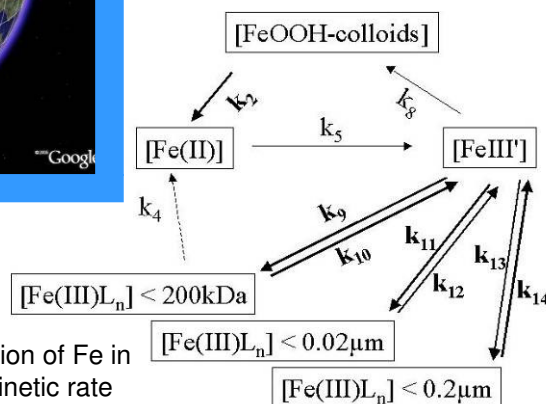


What: Study of the chemistry of iron (Fe) in seawater

Why: to understand A. Distributions, sources and sinks of Fe in the polar oceans
B. The availability of Fe for phytoplankton

Where: 1. Atlantic Pelagia test cruise near Portugal April 2007
2. Arctic Polarstern Cruise ARKXXII/2 Aug-Sept 2007
3. Antarctic Polarstern Cruise ANT XXIV/3 Jan-March 2008

How: 1. Obtain high accuracy datasets of dissolved Fe
2. Study the distribution of Fe over its chemical and physical forms
3. Measure kinetic exchange between the Fe-forms.
(methods: Flow Injection, Voltammetry, Ultra-filtration, UV irradiation)



The physical-chemical speciation of Fe in 0.2µm filtered seawater with kinetic rate constants between the major pools.

Details

Dissolved Fe will be measured along deep (> 4km) sections, where accurate calibration versus international standards is crucial. Moreover a distinction from total dissolved Fe into a suite of size classes (colloids) will be obtained. The relative apportioning of dissolved Fe in colloids and organic bound pools is expected to show gradients both vertical and horizontal in the water column.

The forms of Fe in seawater determines its availability. Fe can exist in colloids and organic complexes as Fe(III), but can also exist as unstable Fe(II). The distribution over the forms will be related to age, source of Fe and position in the water column.

The kinetic exchange between the major pools are crucial for being able to assess how uptake rates of Fe by phytoplankton is controlled.