

Vertical REE profiles in water and DGT in the central Arctic Ocean

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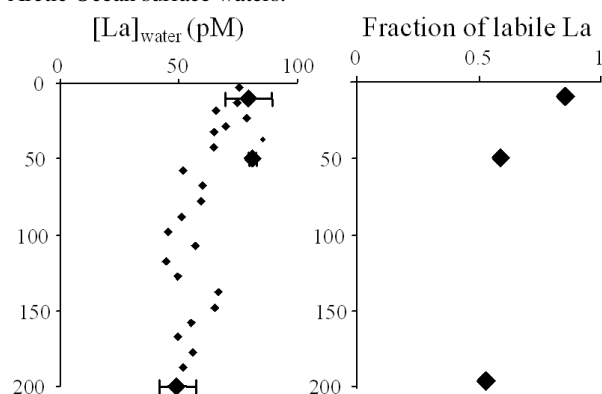
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The first vertical REE concentration profiles from the central Arctic Ocean (88°27'N, 0°45'W) to combine data for filtered water samples with data for the labile REE fraction collected with the in situ method of diffusive gradients in thin films (DGT) are presented here.

During a 3-week drift station in 2001 the pack ice was used as a platform to provide ultra clean conditions for filtration, sampling of water, and deployment of DGT. The DGT-method is an in situ method which employs a hydrogel to collect labile and easily diffusible species from the natural seawater matrix.

REE concentrations for the filtered water samples show no clear trend in the top 200 m of the water column. Surface water C_{La} is ~75 pM. In contrast, results from the DGT deployments show a significant concentration increase towards the surface, with a factor of 2-3 for all REE. C_{La} at 10 m and 200 m measured with DGT are 68 pM and 26 pM respectively. This indicates that the fraction of labile metal increases towards the surface, which is contrary to the nutrient-like behavior observed for many trace elements in the oceans. We therefore conclude that a different mechanism controls the physico-chemical speciation of REE in central Arctic Ocean surface waters.



Results from the 2001 expedition are compared with published data, and with recently analyzed data from Bering Strait and the Chukchi Sea, which, through the trans polar drift, is a possible source for surface water in the central region of the Arctic Ocean.