ALUMINIUM DISTRIBUTION IN THE WATER COLUMN AT THE AZORES REGION

Poster

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Aluminium can be used as a tracer of water masses and oceanographic processes taking place in short time temporal scales (Measures and Edmond, 1988; Gelado Caballero et al., 1996). The metal can settle origin, trajectories or mixing of water masses, specially at the Atlantic Ocean where a large aluminium variability is expected as a result of the several inputs and mixing processes. We have measured the aluminium distribution in of the Azores region in order to establish the distribution pattern

The water sampling was carried out using Niskin bottles. The possible contamination was tested by comparison with seawater sampled directly. Both samples showed differences less than 5%. The HPACSV (High Performance Adsorptive Cathodic Stripping Voltammetry) method [Hernández Brito et al., 1994a] was used to measure on board dissolved aluminium. Determinations were carried out in a flow bench class-100 located inside of a clean room to avoid contamination. The reproducibility of the method and the sampling system was evaluated by closing 30 Niskin bottles at 3000 m (32° N 22° W). The results show an average deviation of 5% and a detection limit of 3.5 nM.

Aluminium was measured at more than 700 samples on board at the sampling grid. Results show that aluminium distribution in the water columns appears to be associated with the physical and biogeochemical processes in the area. Surface distributions shows very large oscillations apparently related with the presence of the Azores front. Mid-depth aluminium distributions seem to follow the water masses pattern. An aluminium maximum in the water column profile appears at intermediate waters (800-1500m) and it seems to be closely related with the intrusion and mixing of Mediterranean waters. A minimum in the aluminium distributions occurs below the Mediterranean waters especially significant at the stations located at the north-west of the sampling grid. A correlation with the presence of traces of Labrador seawater is expected. The aluminium concentrations increase again below 2500m. The concentration profiles near the bottom suggest low aluminium dissolution from the bottom but lateral transport it is not excluded.

References

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