Development of a method for determination of dissolved Te species in open ocean water

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Tellurium (Te) belongs to Group VIb in the periodic table. Te in the ocean have high geochemical reactively for paticulate matter and is concentrated in ferromanganese oxides found in seafloor. The concentration of Te in ferromanganese oxides relative to the mean abundance in earth's crust exceeding ~10^4, highest among all the elements (Hein *et al*., 2003). Therefore, it is important to understand how and where Te enrichment occurs in the ocean. Previous studies focusing on ferromanganese solid samples concluded that the behavior of Te redox species in seawater is important for understanding of this enrichment (Hein *et al*., 2003; Kashiwabara *et al*., 2014). However, the behavior of Te redox species in seawater is poorly known owing to extremely low abundance and difficulty in the analysis.

A combination of $Mg(OH)_2$ coprecipitation and hydride generation-graphite furnace atomic absorption spectrometry has been reported as a method for determination of Te species in seawater (Lee and Edmond, 1985). Several vertical profiles of Te species in seawater were obtained by using this method (Lee and Edmond, 1985).

Although $Mg(OH)_2$ coprecipitation is simple and analytical blanks can be kept low, high contents of Mg in samples may cause physical interference in analytical instruments (Lee *et al.*, 1985/86). In addtion, it is believed to cause significant loss of sensitivity and deterioration of precision (Yoon *et al*., 1990). Therefore, we have been addressing an alternative technique based on $Mg(OH)_2$ coprecipitation, separation of Te species using an anion exchange resin column and measurement with ICPSFMS. In this study, we report results of fundamental experiments in order to establish our analytical procedure.

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