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Determination of trace elements forming oxoanion in salt and bittern

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Summary

In the present study, the analytical method for determination of trace elements forming oxoanion in salt and bittern was developed. The concentrations of trace elements such as V, Cr, As, Mo, W, U in natural salts of Ishigaki Island were determined by inductively coupled plasma mass spectrometry (ICP-MS) after preconcentration by chelating disk or lanthanum coprecipitation, and then the partitioning of trace elements between salt and bittern was also investigated. In chelating disk preconcentration, the recoveries of V and U were relatively high, although those of Cr, As, Mo were less than 20 %. On the other hand, in the lanthanum hydroxide coprecipitation, the recoveries of V, As, Sb, W were larger than 80 %. This means that these elements were effectively preconcentrated by lanthanum coprecipitation. However, it was difficult to determine the elements forming oxoanion in salts and bittern, since the concentration factors was not so high. Therefore, the analytical result by chelating resin preconcentration was reported here. The concentrations of V and U in natural salts involving bittern were 9.88 ng g^{-1} and 19.7 ng g^{-1} , respectively. These concentrations were larger than those in natural salt removing bittern. On the other hand, the concentrations of V and U in the bittern were 19.1 mg l^{-1} and 29.8 mg l^{-1} , respectively, which was corresponding to 10-fold of those in the coastal seawater collected in Ishigaki island.