**Simultaneous determination of Pu isotopes, 237Np, 241Am and 244Cm in seawater samples by** **Accelerator Mass Spectrometry**

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There is a growing demand for the determination of transuranium nuclides in seawater samples for environmental monitoring and tracing, as well as nuclear forensic reasons. A sensitive and stable simultaneous analysis method for Pu isotopes, 237Np, 241Am and 244Cm in samll-volume seawater sample (≤10 L) was established using Accelerator Mass Spectrometry (AMS). The simultaneous purification procedure involves actinide separation and concentration from 10 L of seawater sample by co-precipitation with hydrous titanium oxide (HTiO), followed by an extraction chromatography purification with TK200+DGA tandem resin column, and then small-size chromatography column purification of the Pu+Np and Am+Cm fractions with TK200 and DGA resin, respectively. For the determination of actinides (237Np, 239Pu, 240Pu, 241Pu, 242Pu, 241Am, 244Cm) by AMS, An3+ ions were selected at the terminal voltage of about 260 kV in accelerator. The different ratios of reagents were studied for target preparation to optimize the detection efficiency of actinides, and 0.5 mg Fe was used to co-precipitate the Am, Cm, Pu and Np for target preparation. The chemical recoveries of Pu and Am for the entire procedure were higher than 70% and the recoveries ratio of Pu/Np were proven steadily with an average value of 1.00 ± 0.05 (n>25). With the developed chemical procedure and AMS measurement method, the detection limits were estimated to be 2×105 atoms for transuranium nuclides. The method was validated by analyzing 10L of seawater samples spiked with known amounts of 239Pu, 237Np, 241Am standard solutions. The measured values of 239Pu, 237Np, 241Am agreed very well with the expected values within a 95% confidence interval. These results confirm the reliability and robust of this developed method based on the use of Pu as a non-isotopic tracer for 237Np and ultra-low level of determination by AMS. The developed method has been used for monitoring and environmental tracing of 237Np, Pu isotopes, and 241Am in the marine environment of China.