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A Novel Method For Preparing Uranium-236 Samples In Seawater By Coprecipitation Technology For Accelerator Mass Spectrometry

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Uranium-236 serves as a widely utilized analytical tool for detecting environmental radioactive contamination and tracking natural processes. Given the low concentration of ^{236}U in environmental samples, Accelerator Mass Spectrometry (AMS) emerges as a highly sensitive mass spectrometry method. Based on the AMS system at Guangxi Normal University (GXNU-AMS), we have developed and evaluated a novel approach for analyzing ^{236}U in seawater samples. This method primarily involves the coprecipitation of $\text{Fe}(\text{OH})_3$ from actinides, followed by the extraction and purification of uranium using UTEVA ion exchange resin. To assess the extraction efficiency, we utilized alpha spectrometry (AS) and inductively coupled plasma mass spectrometry (ICP-MS), achieving a remarkable recovery rate of 85%. Furthermore, its applicability was validated through AMS tests on target samples, confirming its effectiveness in analyzing ^{236}U in seawater. This method offers robust technical support for environmental radioactive research, holding significant implications for the field.

Student Submission

Yes

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