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10Be and 26Al sample preparation at the GXNU-AMS laboratory

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Since the 1980s, significant progress has been made in the study of cosmogenic nuclides, of which 10Be and 26Al have been widely used. The invention of accelerator mass spectrometry (AMS) has facilitated widespread application of 10Be and 26Al exposure dating and erosion rates in chronological studies. Quartz, due to its simple composition of silicon and oxygen, is an ideal mineral for generating both 10Be and 26Al , making it a preferred material for cosmic nuclide dating. In this work, Be and Al were effectively separated from Fe and Mg by chemical precipitation based on previous experimental methods. The separation of beryllium and aluminum was achieved by a specialized column instrument with a 12-cm length and a 1.5-cm inner diameter containing Dowex 50W-X8 (H+) cation exchange resin with a particle size of 100-200 mesh. In order to improve the separation efficiency and recovery of beryllium and aluminum, hydrochloric acid solutions of different concentrations were used. The sample preparation process and separation and purification methods for beryllium and aluminum are still being optimized. The goal is to further optimize the extraction and separation of the cosmogenic nuclides 10Be and 26Al from quartz. In addition, this work aims to provide an optimized chemical analytical method to meet the demand for 10Be/26Al measurements in the 3MV AMS system at GXNU.

Student Submission

Yes

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