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Exploration of 41Ca dating

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The cosmogenic isotope 41Ca with a half-life of 99,000 years can serve as a dating tracer for environmental processes. Employing the atom-trap trace analysis (ATTA) method, we realized a precision of 10% on the 41Ca/Ca ratio at the level of 10−17 with the lowest measured 41Ca/Ca ratio standing at (1.99 ±0.34) ×10−17.
For 41Ca exposure dating, we have developed a 41Ca production model, which is based on the CRONUScalc program and LSDn scaling model, enabling the calculation of instantaneous 41Ca production rates at any given geographical location and historical period. Integrating 41Ca/Ca measurements and the 41Ca production rate, we conducted a demonstration application of 41Ca exposure dating of glacial moraines in the eastern Tibetan Plateau.
Regarding burial dating, we are exploring its feasibility for marine environmental samples. We have mapped the global spatial distribution of 41Ca in the ocean and conducted tests on a series of foraminifera and coral samples.

Student Submission

No

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