

IN-SITU COSMOGENIC ¹⁴C IN TERRESTRIAL ROCKS: ANALYTICAL METHOD AND RESULTS

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We have developed a wet analytical method for the quantitative extraction of *in-situ* cosmogenic ¹⁴C from rocks. The experiments are confined to extraction of ¹⁴C from quartz digesting it with HF *in vacuo* using CO and CO₂ as carrier gases. Kel-F is used for the digestion vessel. Results of determination of system blanks for CO₂ and ¹⁴C are presented along with results for terrestrial rock and sand samples in which cosmogenic ¹⁰Be and ²⁶Al have been determined (Nishiizumi *et al* 1991). We find that about half of the *in-situ* ¹⁴C is present in quartz in the form of ¹⁴CO, similar to the case observed for polar ice (Lal *et al* 1990). The technique developed complements that of high-temperature fusion developed by Jull *et al* (1991) for studies of *in-situ* ¹⁴C in terrestrial and extraterrestrial samples. The technique has the advantage of low blanks and separate assays of ¹⁴C activities in the CO and CO₂ phases. The measurement of ¹⁴C activity in CO phase allows practically contamination-free determination of the ¹⁴C activity.

REFERENCES

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COSMOGENIC IN-SITU ¹⁴C IN POLAR FIRN AND ICE SAMPLES

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A recent paper (Lal *et al* 1990) showed conclusively that Antarctic ablation ice from Allan Hills contained appreciable amounts of cosmogenic *in-situ* ¹⁴C, and that about 60% of this was in the chemical form of CO, the rest in the form of ¹⁴CO₂. For dating ice using atmospheric trapped CO₂, it is important to know the fraction of *in-situ*-produced ¹⁴C present in it. We are carrying out experiments to determine the amounts of ¹⁴CO and ¹⁴CO₂ in accumulation firn and ice from Greenland and Antarctica. We hope to present these results which should unambiguously estimate the contributions of *in-situ* ¹⁴C to the total ¹⁴C activity present in accumulation ice.

REFERENCE

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