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A PRELIMINARY REPORT ON THE CHARACTERISTICS OF A CO_2 GAS ION SOURCE MGF-SNICS/SIMULTANEOUS INJECTOR AT NIES-TERRA

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The accelerator mass spectrometer at the National Institute for Environmental Studies (NIES-TERRA; Tandem accelerator for Environmental Research and Radiocarbon Analysis) has two ion source-injector combinations, *i.e.*, the combination of multi-cathode Cs sputter source for solid samples (MC-SNICS) with a fast bouncing sequential injector, and that of multiple gas feed negative ion source (MGF-SNICS) with a simultaneous injector dedicated to the carbon isotope analysis of gaseous samples. The MGF-SNICS (Ferry, in press) was developed based on the SNICS-II source with influences from the existing gas sources (Bronk and Hedges 1987; Middleton, Klein and Fink 1989). The target is composed of a piece of high purity (99.999%) Ti mounted in a small aluminium shell. CO_2 sample is fed from a 1.5 ml stainless steel cylinder through a 75-cm-long stainless steel tube. The gas flow rate is controlled by a metering valve attached on a side of each cylinder. The source has twelve independent sets of the above target-tube-valve/cylinder complex in a target magazine assembly to minimize the chance of cross contamination between the samples.

The negative carbon ions extracted from the MGF-SNICS are separated and then combined by the two magnetic analyzers and three electrostatic lenses for the simultaneous detection of ^{14}C, ^{13}C and ^{12}C isotopes after acceleration. The basic design of the simultaneous injector is influenced by the system developed by Southon *et al.* (1990). Combination of a gas ion source with a simultaneous injector is expected to effectively suppress space charge effects (Bronk Ramsey and Hedges 1994) caused by the presence of large amount of O^-.

Preliminary data on the performance of MGF-SNICS will be reported.

References

Bronk, C. R. and Hedges, R. E. M. 1987 *Nuclear Instruments and Methods* B *in Physics Research* 29: 45.
____1990 *Nuclear Instruments and Methods in Physics Research* B52: 322.
Bronk Ramsey, C. and Hedges, R. E. M. 1994 *Nuclear Instruments and Methods in Physics Research* B92: 100.
Ferry, J. A., Loger, R. L., Norton, G. A. and Raatz, J. E. in press.
Middleton, R., Klein, J. and Fink, D. 1989 *Nuclear Instruments and Methods in Physics Research* B43: 231.
Southon, J. R., Nelson, D. E. and Vogel, J. S. 1990 *Nuclear Instruments and Methods in Physics Research* B52: 370.

MICROBEAM AMS: PROSPECTS OF NEW GEOLOGICAL APPLICATIONS

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AMS applications in geology have hitherto concentrated on the use of cosmogenic isotopes and rare *in-situ* produced isotopes for geomorphological and geophysical studies. Special features of AMS lend themselves to more general applications to other isotopes and geochronological systems. Advantages of *in-situ* microanalytical techniques over bulk techniques have been demonstrated not only in terms of expedience but also in allowing analysis of microscopic geological samples (*e.g.*,