(allows the automated cryogenic transfer of CO_2 from splitting line to graphite reactor), and automated data transfer to the SYBASE database upon graphite reaction completion (minimizes manual data entry). Through these developments we can now conduct up to 26 graphite reactions per day.

The SPL goal for 1996 is to become more productive through increased automated batch processing. In order to achieve this, we are presently duplicating the automated sea water stripping system to allow a two-fold increase in production (from 10 to 20 samples/day). Recent $\delta^{13}C$ analyses of local sea water (internal standard) stripped of CO_2 in the SPL indicate the overall precision of the analysis is between 0.04–0.06‰. Work has begun towards automating the organic carbon combustion process, and automated batch processing of $CaCO_3$ hydrolysis reactions has recently been implemented. These systems will be described, as well as issues pertaining to insuring high quality results while increasing productivity.

References

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^{60}Fe MEASUREMENTS WITH AN EN TANDEM ACCELERATOR

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The measurement of the long-lived radionuclide ^{60}Fe (β-decay, no γ, $t_{½} = 1.5 \times 10^5$ yr) is of interest for different applications. The main production mechanisms of ^{60}Fe are double neutron capture in ^{58}Fe and spallation reactions of copper or nickel. In astrophysics these processes are of importance in providing information (*e.g.,* from meteorites) about the early solar system and supernovae. The long half-life may also have implications on the management of waste produced by accelerators or nuclear reactors. The very low abundances of ^{60}Fe can only be measured with accelerator mass spectrometry. First experiments were made by Kutschera *et al.* (1984, 1986) with a FN tandem linac using a 360 MeV ion beam. Sample material from a beam dump (spallation of copper) and a meteorite were examined giving ^{60}Fe/ Fe ratios of 10^{-7} (Kutschera *et al.* 1984), resp. 10^{-14} (Kutschera *et al.* 1986). In combination with a specific activity measurement, the first experiment was used for the determination of the half-life (Kutschera *et al.* 1984).

A new attempt to measure ^{60}Fe at low energies is being made using our EN tandem accelerator. At 6 MV the maximum yield from a carbon stripper foil in the terminal is for charge state 9^+, resulting in an energy of 60 MeV. A pure iron sample (99.99%) gave unexpectedly high nickel rates (^{60}Ni/ Fe ≈ 0.3 ‰) in the detector. This can be explained by the much higher negative ion yield for nickel relative to iron and by contamination from ion source surfaces. Due to ^{60}Fe having a two units lower nuclear charge than stable ^{60}Ni, an isobar suppression in our gas ionization chamber of almost six orders of magnitude was possible. To reduce the high counting rates of nickel, we plan to use our