A NEGATIVE SURFACE IONIZATION SOURCE FOR AMS

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For isotopes with large electronegativities (\(^{129}\text{I}, ^{36}\text{Cl}\)) a negative ion source based on surface ionization is potentially very attractive, both from the point of view of efficiency, and/or selectivity from interfering isobars. We have constructed a prototype source based on this principle, using a heated surface of LaB\(_6\) or BaO. We have carried out preliminary tests of the source on the isotope separator SIDONIE using samples prepared from stable iodine (AgI).

The results demonstrate the feasibility of using small samples (<60 µg iodine) and efficiencies of >1%. This opens up the possibility of measuring \(^{129}\text{I}/^{127}\text{I}\) ratios directly from 1 liter ocean water samples, without addition of carrier.

\(^{10}\text{Be} \) AND DUST IN POLAR ICE

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The dust content of today’s precipitation in the polar regions of the Earth is so small that the contribution of recycled, dust-bound \(^{10}\text{Be}\) to the total \(^{10}\text{Be}\) signal in polar snow and ice is generally regarded to be negligible. During the last ice age, however, dust fluxes were larger than today by at least one order of magnitude. One is therefore forced to examine the relevance of dust as a source of \(^{10}\text{Be}\) in polar ice cores. New experimental data from the Summit GRIP ice core suggest that the ratio of dust adsorbed \(^{10}\text{Be}\) to the total \(^{10}\text{Be}\) content is much larger than expected, since the \(^{10}\text{Be}\) concentration of the dust is very high. The dust contribution to the \(^{10}\text{Be}\) signal, therefore, cannot be neglected. Its knowledge is necessary for a thorough interpretation of the whole \(^{10}\text{Be}\) record.

These unexpected findings lead to some fundamental questions about possible interferences between the two sources of \(^{10}\text{Be}\) in precipitation, i.e., dust with recycled \(^{10}\text{Be}\) and aerosols with recently produced \(^{10}\text{Be}\). The question has to be addressed, under which conditions the two sources for \(^{10}\text{Be}\) can be separated at all. A status report on actual problems and possible solutions will be given.

STATUS OF THE NSF-ARIZONA AMS LABORATORY


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In this paper we will present a summary of the activities at the NSF-Arizona AMS laboratory over the past year. In addition to a description of some of the measurements, the summary will include details of: 1) latest results concerning precision and accuracy of radiocarbon measurements; 2) mea-