

MASS SPECTROMETRY WITH AN ECR ION SOURCE

M. Hotchkis[#], D. Button, ANSTO, Menai, Australia

Abstract

Several groups [1-3] have demonstrated the usefulness of ECR ion sources in forms of mass spectrometry, for the detection of rare long-lived radioisotopes, trace elements and stable isotope ratios. Mass spectrometry imposes strict constraints on the ion source. First, the ion source must be free of backgrounds at the same m/q ratio as isotope of interest. Backgrounds take several forms, including beams generated from residual gas or other materials in the source, either of the element of interest, or other elements which cause isobaric or other m/q ambiguities. Second, the ion source must exhibit a minimum 'memory' effect from sample to sample. We are interested in isotopic ratios of carbon, nitrogen and oxygen. These elements are ubiquitous in vacuum systems and so this work has its own particular

challenges, especially in relation to the design and operational characteristics of the ion source. Initial work has revealed retention effects which reduce the sample clear out rates, and cause persistent backgrounds [4]. We will present results of our most recent efforts to control these problems.

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- [2] M. Kidera et al., Eur. J. Mass Spectrom. 2007; 13: 239.
- [3] M. Hotchkis et al., Rapid Comm. Mass Spec. 2008; 22: 1408-1414.
- [4] D. Button and M.A.C. Hotchkis, Proc. 18th ECRIS Workshop, Sept 15-18, 2008, Chicago, USA, <http://www.JACoW.org/>.

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[#]mah@ansto.gov.au