



Contribution ID: 269 Contribution code: PSA-48

Type: Poster

Development of Li molecular removal method that interferes with ^{14}C measurement using laser

Monday, 21 October 2024 16:55 (20 minutes)

Mass of Li molecule (Li_2) is same to ^{14}C , so ^{14}C measurement is frequently interfered by it in using two plus ion of ^{14}C after gas stripping of AMS. Removal of Li molecule (Li_2) is important in our AMS which use two plus ion of ^{14}C . AMS generate negative ions of carbon ($^{12}\text{C}^-$, $^{13}\text{C}^-$, $^{14}\text{C}^-$) and Li_2^- in a source, which have binding energies of electron of 1.262eV, 982.35nm($^{14}\text{C}^-$) and 0.42eV, 2.952nm (Li_2^-). Therefore, if laser of energy (1.166eV, 1064nm) between binding energies of electron in ^{14}C and Li_2^- is incident on negative ions of $^{14}\text{C}^-$ and Li_2^- , one electron of Li_2^- can be detached but that of $^{14}\text{C}^-$ can't be detached. Laser was equipped near injector magnet and is incident on negative ions ($^{12}\text{C}^-$, $^{13}\text{C}^-$, $^{14}\text{C}^-$ and Li_2^-) on direction of Tandem accelerator after injector magnet. What the number of Li_2 were decrease and what those of ^{14}C were not changed were checked in E- Δ E spectrum of ionization chamber detector.

Student Submission

No

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Session Classification: Poster Session A

Track Classification: New and Advanced AMS Techniques