44Ti, 26Al and 53Mn samples for nuclear astrophysics : the needs, the possibilities and the sources

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)

ID 1543243
Author(s) Dressler, R.; Ayranov, M.; Bemmerer, D.; Bunka, M.; Dai, Y.; Lederer, C.; Fallis, J.; Murphy, A. StJ; Pignatari, M.; Schumann, D.; Stora, T.; Stowasser, T.; Thielemann, F-K; Woods, P. J.
Author(s) at UniBasel Thielemann, Friedrich-Karl ; Pignatari, Marco ;
Year 2012
Title 44Ti, 26Al and 53Mn samples for nuclear astrophysics : the needs, the possibilities and the sources
Journal Journal of physics. G, Nuclear physics
Volume 39
Number 10
Pages / **Article-Number** 105201
Exploration of the physics involved in the production of cosmogenic radionuclides requires experiments using the same rare, radioactive nuclei in sufficient quantities. For this work, such exotic radionuclides have been extracted from previously proton-irradiated stainless steel samples using wet chemistry separation techniques. The irradiated construction material has arisen from an extended material research programme at the Paul Scherrer Institute, called STIP (SINQ Target Irradiation Program), where several thousand samples of different materials were irradiated with protons and neutrons of energies up to 570 MeV. In total, 8 x 10(17) atoms of Ti-44, similar to 10(16) atoms of Al-26 and similar to 10(19) atoms of Mn-53 are available from selected samples. These materials may now be used to produce targets or radioactive beams for nuclear reaction studies with protons, neutrons and alpha-particles. The work is part of the ERAWAST initiative (Exotic Radionuclides from Accelerator Waste for Science and Technology), aimed at facilitating new collaborations between the isotope producers and users from different scientific fields including nuclear astrophysics.
Publisher IOP Publ.
ISSN/ISBN 0305-4616
edoc-URL http://edoc.unibas.ch/dok/A6083433
Full Text on edoc No;
Digital Object Identifier DOI 10.1088/0954-3899/39/10/105201
ISI-Number WOS:000309548000014
Document type (ISI) Article