DISOCIACION COULOMBIANA DEL ^{27}P

S.Beceiro (USC) D. Cortina (USC) K. Suemmerer (GSI) para la colaboracion S223

Some nucleosynthesis models developed in the 1940's assumed that nuclide were produced in a primordial process so called fireball, at the beginning of the Universe; those models failed however to explain the experimental observation that stars do not have the same surface composition. Later on, with the help of satellites, the measurement of Î³-ray coming from the Galaxy confirmed the idea of an ongoing nucleosynthesis scenario still active in stars. The first evidence was the measurement of the Î³ -ray line from the de-excitation of 26Mg produced by the Î² -decay of 26Al. This nucleus has a life time of 1.05x106 years, much shorter than the age of the Universe, hence the importance of the knowledge of this nucleus and its neighbourhood.
Î³ -ray measurements at the Galactic plane showed that 26Al is mainly produced in massive stars (novae and supernovae). One possible production way is the rp-process. 26Al has a metastable and a ground state, the first one decays predominantly to the ground state of 26Mg, nevertheless the ground state decays to the first excited of 26Mg giving a Î³ -ray of 1.809MeV (the one detected in galactic measurements). The Î² -decay of 26Si mainly populates the 26Al(g.s.), and the production of the 26Si comes from the competition of the Î² -decay 25Al and the reaction 25Al(p,gamma)26Si that is destructed in the 26Si(p,gamma)27P. Within this scenario the 26Si(p,gamma)27P reaction appears as important, first because it is in the rp-path and secondly because it influences the generation of 26Al.
The direct study of the reaction 26Si(p, Î³)27P at astrophysical energies is extremely challenging due to the low intensity associated to low energy radioactive beams and low cross sections involved. Coulomb dissociation studies of the inverse kinematics reaction 27P(Î³ ,p)26Si have instead been proposed. A 27P beam impinges on thick Pb target. The 27P is then excited via the absorption of a virtual photon to a particle unbound state which decays into p+26Si. This inverse reaction profits of a much larger cross section The experiment was performed using the ALADIN-LAND setup at GSI with a 36Ar primary beam at 500MeV. A secondary beam of 27P was produced by projectile nuclear fragmentation at the FRS. The ALADIN-LAND setup allows to measure in full kinematics. After the Coulomb dissociation of 27P under the effect of the thick Pb target, both outgoing fragments, protons and 26Si enter in the large acceptance magnet (ALADIN) and are deflected differently according to their associated rigidities. A set of detectors located after the magnet allow to track and identify protons and fragments in an event by event basis. Preliminary results of the associated invariant mass spectrum will be presented.