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# Uncertainties in the production of p nuclides in the fast proton induced p - processes

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The fast proton induced p –processes reactions play a key role in the astrochemical elements yields of the big bang nucleosynthesis for standard cosmology. Astrophysical concurrence of several p - process mechanisms in the production of p –nuclei was analyzed for proton energy up to 25 MeV.
Cross sections of proton induced reactions and contribution of each nuclear reaction mechanism for each process are evaluated theoretically and measured experimentally at Electrostatic Generator EG-5 from FLNP for incident protons up to 5 - 10 MeV. For protons up to 4-8 MeV compound processes are dominant and they are described applying Hauser –Feshbach statistical approach. At higher energies direct and pre-equilibrium mechanisms cannot be neglected. Contribution to the cross section of direct mechanism was determined using DWBA approach and pre-equilibrium processes by exciton model. Parameters of optical potential and levels density for incident and emergent channels were also extracted. Cross sections, parameters of potentials and levels density are of a great importance for astrophysical reactions rates estimation and for estimation of the astrochemical elements abundance.
The cross section –measurement uncertainties were assigned individually to a larger set of experimental parameters varied simultaneously in post-processing in an extended nuclear reaction modelling. The statistical uncertainties reduction was done by Talys using a Bayesian Monte Carlo procedure based on the EXFOR database and they were in fair agreement with the standards. The uncertainties in the nuclear element abundances originating from the combined effect of experimental and theoretical errors leading to total uncertainties in the final abundances were determined.
Present results are obtained in the frame of the programs dedicated to nuclear reactions for astrophysics developed at JINR Dubna basic facilities.

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