NE ISOTOPES PHOTONUCLEAR REACTION CROSS SECTIONS EVALUATION

V.V.Varlamov, M.E.Stepanov, N.G.Efimkin

The problems of DT plasma diagnostics are widely discussed. A theory has been derived to estimate the production of higher than 14 MeV neutrons due to the transfer of alpha energy to tritons during the slowing down of DT alpha particles. Several threshold neutron reactions were selected for plasma diagnostic technique. One is Ne-20(n,2n)Ne-19.

The high energy (above 17 MeV) Ne-20(g,n)Ne-19 reaction is a concern. Therefore there are the needs for this reaction cross section data for the energies of incident photons higher than reaction threshold 16.9 MeV. Till now only the cross section for the reaction (g,xn) = [(g,n) + 2(g,2n) + (g,np) + ...] has been published for Ne-20.

The evaluation of the needed Ne-20(g,n)Ne-19 reaction cross section has been done on the base of combined using of mentioned Ne-20(g,xn) reaction cross section and concerned information on the (g,xn), (g,n)+(g,np), and (g,2n) reaction cross sections for Ne-nat and on the (g,2n) reaction cross section for Ne-22. The data for reaction thresholds and appropriate subtraction procedures were used. The (g,n) and (g,2n) reaction cross sections were obtained for Ne-20 for energies below the threshold of (g,np) reaction (23.3 MeV).

YIELDS OF Tl ISOTOPES FROM THE ^{197}Au + α REACTION AND ESTIMATIONS OF RADIATION EXPOSURE AFTER INTRAVENOUS INJECTION OF RADIOPHARMACEUTICAL Tl PREPARATION

D.O.Eremenko, O.V.Fotina, Yu.L.Parfenova, S.Yu.Platonov, E.I.Sirotinin, O.A.Yuminov

The specific interest to Tl isotope yields is connected with medical use of Tl preparations for diagnostic of the myocard. The isomeric yields of the ^{200,199m,g,198}Tl igotopes were calculated for the ^{197}Au + α reactions at energies of α - particles from 15 to 30 MeV. This analysis was carried out in the frame of the statistical theory of nuclear reactions with Hauser-Feshbach approximation including the estimations of preequilibrium processes on the base of Griffin's model. The results are compared with estimations of other authors and our measurements performed with the cyclotron of MSU. The estimations of radiation dose after intravenous injection of Tl preparations are performed using human body phantom. Comparative analysis of the influence of radiation on organs and whole human body for ^{201}Tl and ^{199}Tl is presented.