

## Fragmentation of carbon on elemental targets at 400 A MeV

The total charge-changing reaction cross-sections and the partial cross-sections of projectile fragments(PFs) production for the fragmentation of  $^{12}\text{C}$  on C, Al, Cu, Pb and  $\text{CH}_2$  targets at the highest energy of 400 A MeV are investigated. It is found that the total charge-changing cross-sections and the partial cross-sections of PFs production for the fragmentation are independent of the beam energy, and increase with increase of mass of target for the same beam energy. The total charge-changing reaction cross section is the same as the prediction of Bradt-Peters semi-empirical formula, PHITS and NUCFRG2 models. The partial cross section of PFs production increases with the increase of the mass of target, and it is the same as the prediction of NUCFRG2 model. The average scattering angle of beam particle is less than the mean emission angle of PF, and the width of scattering angle distribution of beam particle is less than that of emission angle distribution of PF. The mean emission angle of PF increases with the mass of target for the same beam energy and charge of PF.

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