

Energetics of intermediate velocity proton collision with naphthalene

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The proton collision with polycyclic aromatic hydrocarbons is important from astrophysical as well as biological point of view [1]. Due to broader energy deposition in ion-molecule collision, plasmon excitations are difficult to isolate from other physical processes. The proton (50 keV to 240 keV) collision with gaseous naphthalene at Low Energy Ion Beam Facility, IUAC, New Delhi using an electron cyclotron resonance ion source was performed in both electron emission (EE) and capture (EC) mode of detection. This study explores isolation of EE and EC mode of collision dynamics on the basis of energetics involved in respective modes by comparing the yields with photo dissociation curves. The independent nature of ionization as well as evaporation cross sections in EE mode and fragmentation yield in EC mode for all impact energy are attributed to the collective excitation and resonant capture phenomenon respectively [2]. However the decreasing trend of fragmentation yield as a function of impact energy in EE mode was reproduced (Fig. 1) with the help of theoretical cross section obtained by our *Monte Carlo* simulation for electronic stopping within Local density approximation [3].

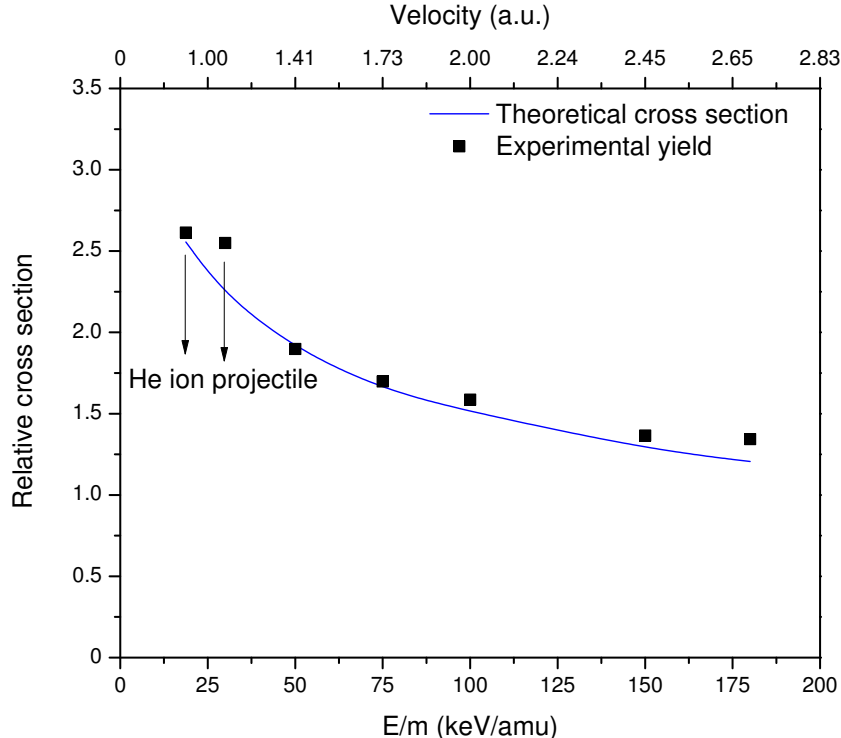


Figure 1: Fragmentation yield (obtained in EE mode) comparison with theoretical cross section (obtained from Monte Carlo simulation) as a function of impact energy.

References

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