Type: poster

Fragmentation dynamics of N2Ar dimer induced by highly charged ions

Monday, 19 September 2016 18:00 (2 hours)

Molecular dimers widely exist in planetary atmosphere, and play an important role in molecular and surface physics, astrophysics, and climate. The N2Ar dimer is a typical molecular complex of Ar with N2, which is particularly relevant to the atmosphere of Titan.

In the present work, the 1 MeV Ne^{8+} ions were used to produce the (N2Ar)^{3+} ions, the momenta of fragment ions of three-body fragmentation of N2Ar were measured based on the reaction microscopy. Our results indicate that (N2Ar)^{3+} ion can decay from nonsequential dissociation or sequential dissociation. These three mechanisms can be directly distinguished in Dalitz plot and Newton diagrams. In the sequential dissociation processes after single electron loss of Ar site and double electron loss on N2 site, the dimer ion starts to dissociate along the potential energy curve of N2^{2+} + Ar+, the metastable N2^{2+} rotates when it is far away from Ar+ and finally fragment into two N+ ions, the two fine structure appear in Newton diagram. The ring structure indicates the dissociation from the metastable N2^{2+} ions of longer lifetime and the fusiform structure is from the dissociation from the metastable N2^{2+} ions of shorter lifetime.

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