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Dehydrogenation involved Coulomb explosion of molecular C_2H_4FBr in an intense laser field

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Abstract

The dissociative double ionization (DDI) of molecular 1-fluoro-2-bromoethane (FBE) in an intense laser field has been investigated by dc-slice imaging technology. The DDI channels involved with dehydrogenation are revealed and it's believed both the charge distribution and the bound character of real potential energy surfaces of parent ions play important roles in the dissociation process. The relationship between the potential energy surfaces of the precursor species and the photofragment ejection angles are also discussed and analyzed. Furthermore, the competition between the DDI channels has been studied and the C-C bond cleavages dominate the DDI process at relative higher laser intensity.

Keywords: dissociative double ionization, potential energy surface, femtosecond laser pulses

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