PULSED-FIELD IONIZATION ELECTRON AND PHOTOIONIZATION SPECTROSCOPY OF Li-NAPHTHALENE AND ANTHRACENE COMPLEXES

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Li-naphthalene ($C_{10}H_8$) and anthracene ($C_{14}H_{10}$) were produced by reactions of laser-vaporized Li atoms and ligand vapor. Although naphthalene has a sufficient vapor pressure at the room temperature, the vapor pressure of anthracene is rather low. Therefore, anthracene was co-vaporized by laser ablation of a target made of Li and organic powders. The pulsed-field ionization electron spectrum of Li-naphthalene shows a band origin at 35489 (5) cm^{-1} and extensive vibrational structures with intervals in the 140-1400 cm^{-1} range. These vibrational structures were assigned to excitations of Li-naphthalene stretches and bends as well as in-plane and out-of-plane ring deformations. This complex has a Cs structure with Li located above one of the rings, and the naphthalene plane is significantly distorted in the neutral state. Unlike naphthalene where two six-membered rings are the same, the side and central rings are different in anthracene. Although vibrationally resolved electron spectrum has not been obtained, the photoionization efficiency spectrum of Li-anthracene exhibits two thresholds at 33800 (300) and 37200 (200) cm^{-1}, which correspond to ionization of two structural isomers with Li binding to the side and central rings, respectively.