INFRARED SPECTRA OF PRODUCTS OF THE ULTRAVIOLET AND VACUUM ULTRAVIOLET IRRADIATION OF BENZENE TRAPPED IN SOLID NEON

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When a solid solution of benzene in a large excess of neon is exposed to the 254-nm output of a medium-pressure mercury arc, prominent infrared absorptions of fulvene and of o-benzyne appear. On prolonged photolysis, propyne absorptions grow substantially. Analogous experiments using benzene-d_6 yield the first infrared spectral data for fulvene-d_6, for which the positions of the most prominent absorptions agree well with those predicted by density functional calculations. Studies in which the benzene is exposed to 10.2 eV or to 16.6 to 16.85 eV radiation during deposition have also been conducted. At these energies, ionization may occur. In addition to absorptions of the same products as those obtained on 254-nm photolysis, new absorptions appear. Possible carriers of these new peaks will be considered.