SPECTROSCOPIC IDENTIFICATION OF *p*-CHLORO-α-METHYLBENZYL RADICAL IN THE GAS PHASE

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We report the first spectroscopic identification of the *p*-fluoro-α-methylbenzyl radical in the gas phase. Precursor *p*-fluoro-ethylbenzene seeded in a large amount of inert carrier gas helium was electrically discharged to produce the benzyl-type radicals in a corona excited supersonic expansion using a pinhole-type glass nozzle, from which the vibronic emission spectrum was recorded in the visible region using a long path monochromator. From an analysis of the spectrum observed, we found the formation of *p*-fluoro-α-methylbenzyl radical as well as *p*-fluorobenzyl radical in the jet from the precursor. After eliminating the bands belonging to *p*-fluorobenzyl radical using the known data,[a] we identified spectroscopically the formation of the *p*-fluoro-α-methylbenzyl radical, in which the energy of the $D_1 \rightarrow D_0$ electronic transition and a few vibrational mode frequencies in the ground electronic state were determined by comparison with those from an *ab initio* calculation and with those from the known data of the precursor.

[a] S. K. Lee and D. Y. Baek *Chem. Phys. Lett.* **301**(3-4), 407-412 (1999).