Tae In Ryu et al., J Chromatogr Sep Tech 2018, Volume 9
DOI: 10.4172/2157-7064-C1-041

Analytical validation based on oxidation in the atmospheric pressure chemical ionization for acenaphthylene

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The coupling of gas chromatography (GC) with atmospheric pressure chemical ionization (APCI) has been studied more than 40 years ago by Horning *et al.* Recently, Schiewek *et al.* and McEwen *et al.* developed ion sources for performance in both liquid chromatography (LC) and GC. APCI is a soft ionization technique with gas-phase ion molecule reactions at atmospheric pressure, where ions are generated by corona discharge in a chamber. The soft ionization made by APCI shows less fragmentation and more selective molecular ion or protonated ion in comparison with electron ionization. In this study, ionization of acenaphthylene using APCI was observed not only in precursor ion but also acenaphthylene added oxygen in mass spectra. The acenaphthylene oxidation is shown to be due to gas-phase reactions brought on by oxidative radicals such as ozone and OH• derived from oxygen or water in the APCI environment. Signals of $[M+16]^{\bullet+}$, $[M+32]^{\bullet+}$ and [M+48]•+ are due to oxidation ($[M+O_n]^{\bullet+}$). These specific mass spectra patterns of naphthalene by APCI is a prospective method to easily confirm the existence of polycyclic aromatic hydrocarbons in various samples.

Biography

Tae In Ryu has completed his PhD from the Department of Chemical Engineering, Sungkyunkwan University, South Korea. He is currently working in the Research Development and Education Division, National Institute of Chemical Safety, South Korea. He is studying non-target screening for hazardous chemical accidents. He has published more than 10 papers in reputed journals.

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