X-Ray Spectral Investigation of Silicon-Ligand Bond in $Si(OC_2H_5)_4$, $Si(C_6H_5)_4$ and $(OH)_2Si(C_6H_5)_2$ Compounds

Abstract

X-Ray photoelectron and X-ray emission spectra ($SiK\alpha_{12}$, and $SiK\beta_{1,3}$) of the titled silicon compounds are studied. These spectra reveal only σ-bonding in case of $Si(OC_2H_5)_4$ between silicon and ligand, but in case of $Si(OC_2H_5)_4$ and $(OH)_2Si(C_6H_5)_2$, both σ- and π-bonding have been exhibited. The observation is discussed in terms of simple molecular orbital theory. The SiK β emission spectrum of $(OH)_2Si(C_6H_5)_2$ shows that the compound suffers a decomposition due to heat produced during X-ray bombardment.