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The effect of substituents at a coordinated center on the strength of P → Sn donor-acceptor bond

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Abstract

1. The thermodynamic parameters for the complexing of SnCl4 and organotin chlorides with organophosphorus donors satisfy the general linear ΔH° vs ΔS° relation applying to donor-acceptor complexes. 2. The energy of the P → Sn bond in the (C2H5)nSnCl4-n · (C4H9)3P complexes falls off as the number of Cl atoms in the acceptor molecule is reduced. 3. The energy of the P → Sn bond in the SnCl4 · R1R2R3P complexes, and of the O → Sn bond in the SnCl4 · R1R2R3PO complexes, are closely dependent on inductive and resonance effects from the substituents R1, R2, and R3. The sensitivity of the coordination centers to substituent effects is higher in the phosphines than in the phosphine oxides.

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