

Thermodynamics of Adduct Formation Between Copper (II) Salicylaldimine Chelates and Nitrogen Bases

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ABSTRACT

The equilibrium constants, free energies, enthalpies and entropies for 1:1 adduct formation of Cu (II) salicylaldimines chelates with series of nitrogen bases have been measured spectrophotometrically in benzene, cyclohexanone, and dichloroethane. The equilibrium constants for adduct formation were found higher for Cu (II) salicylidenephenylenediimine and the measured values span the range from 1.11 to 11.33 l.mol⁻¹. The order of the equilibrium constants were determined by the donor strength of the base. In a series of pyridines the stability of the adducts increases in the order: 3-aldehydopyridine < 2-methyl-pyridine < pyridine < 4-methylpyridine. Variation of the stability of the adducts due to changing bases were attributed in part to change in donor power and in part to steric effects. The solvents are ranked as follows by this constant: benzene > cyclohexanone > dichloroethane.

INTRODUCTION

There is a considerable interest in the field of metal complexes catalysis^(1, 2), as well as their use as reagents in organic synthesis^(3, 4). Of particular interest is metal chelate catalysis and in this field monomeric and polymeric salicylaldemines complexes with a variety of metal^(6, 7) showed activity in catalyzing the oxidation of cumene and phenol by oxygen to acetophenone and quinone respectively.

The formation of adducts of metal chelates plays an important role in the synergistic enhancement of the solvent extraction of metal ions⁽⁸⁾.