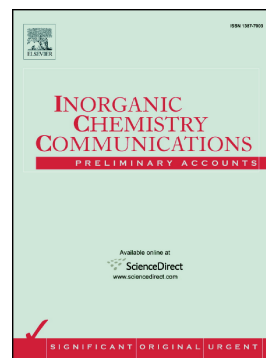


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# Synthesis and catalysis of hydrolysis of phosphate esters by Zn(II), Cu(II), and Ni(II) Schiff base complexes

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## 1.1 Abstract

The Schiff base ligand 2-(((2-(pyridin-2-yl)ethyl)imino)methyl)phenol (Salpea) was derived from the condensation reaction of 2-(2-pyridyl)ethylamine and salicylaldehyde. Three Schiff base complexes of the ligand were synthesized by reacting the Salpea ligand with Zn(II), Cu(II), and Ni(II) perchlorate hexahydrate salts. The compounds were analyzed by H-NMR, FT-IR, and UV-visible spectroscopies. CHN elemental analysis and x-ray crystallography were also employed for characterization in this research. Kinetic studies were performed on these complexes to evaluate their efficiency as catalysts for the hydrolysis of 4-nitrophenylphosphate (4NPP) in DMSO:H<sub>2</sub>O (1:1) solvent mixture using a TRIS buffer solution. It was determined experimentally that the complexes are catalytically active in hydrolysis of the phosphate ester studied (4NPP). Second order rate constants on the order of  $10^{-3} \text{ M}^{-1}\text{s}^{-1}$  were observed for the complexes studied.

*Keywords:* Zinc(II) complex, Copper(II) complex, Nickel(II) complex, hydrolysis, phosphate ester, 2-(((2-(pyridin-2-yl)ethyl)imino)methyl)phenol

## 1.2 Introduction

Metalloenzymes are enzymes containing one or more metal ions at their active site. Zn(II) is the

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