

## ABSTRACT

This thesis is divided into two parts. In the first part, a domestic microwave oven has been employed as a convenient laboratory aid for the rapid and improved synthesis of pyridones from pyridines (and substituted pyridines) in the presence of first row transition metal ion salts, particularly zinc(II).

Fluorescence spectroscopy was used as a convenient tool for both the detection as well as the quantification of pyridones produced.

Extensive experimentation to optimize microwave heating conditions as well as experiments to determine optimal reaction conditions were also carried out. The data obtained suggested that average digestion times of the order of 2 1/2 minutes afforded best results. This translates to considerable savings in reaction times since previous methods necessitated the use of autoclaves at 300 °C for 8 hours.

In the second part, some reactions of coordinated hydrazones and azines were investigated and varying synthetic routes used to produce mixed azine complexes. Initially, complexes of salicylaldehyde hydrazone and aldazine were prepared and characterized. A new hydrazone was then prepared from acetylacetone (2,4-pentanedione) and hydrazine. Its complexes with first row transition metal ions gave analyses suggesting that the ligand was bidentate;

bonding through the azomethine nitrogen and oxygen atoms to give chelates with metal:ligand ratios of 1:2. Cyclic voltammetry measurements in DMF indicated the non-electrolytic nature of the cobalt(II) and zinc(II) complexes.

Mixed azines from salicylaldehyde hydrazone and selected carbonyls were prepared in good yield and high purity using simple experimental techniques. Complexes of some of these ligands were prepared.