

# Turkish Journal of Chemistry

Turkish Journal

of

Chemistry

Thermodynamic Studies of Some Complexes of 2-benzoylpyridine 4-phenyl-3-thiosemicarbazone

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**Abstract:** The stability constants of the Co(II), Ni(II), Cu(II) and Zn(II) complexes with 2-benzoylpyridine 4-phenyl-3-thiosemicarbazone were determined using a spectrophotometric method at different temperatures (25, 30, 35 and 40  $\mu$ m 0.1 $^{\circ}$ C) and ionic strengths (0.05, 0.01 and 0.20 M KNO<sub>3</sub>) in 50 % (v/v) aqueous ethanol. Plots of thermodynamic stability constants at zero ionic strength ( $\ln K^{\circ}$ ) versus  $T^{-1}$  gave linear curves and  $\Delta H^{\circ}$  and  $\Delta S^{\circ}$  were also calculated from these plots. Moreover, the changes in free energy for each metal-ligand system were calculated from the following equation.  $\Delta G^{\circ} = -RT \ln K^{\circ}$ .

**Key Words:** Stability, thiosemicarbazone, ligand, thermodynamic, spectrophotometry.

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Turk. J. Chem., **22**, (1998), 123-128.

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