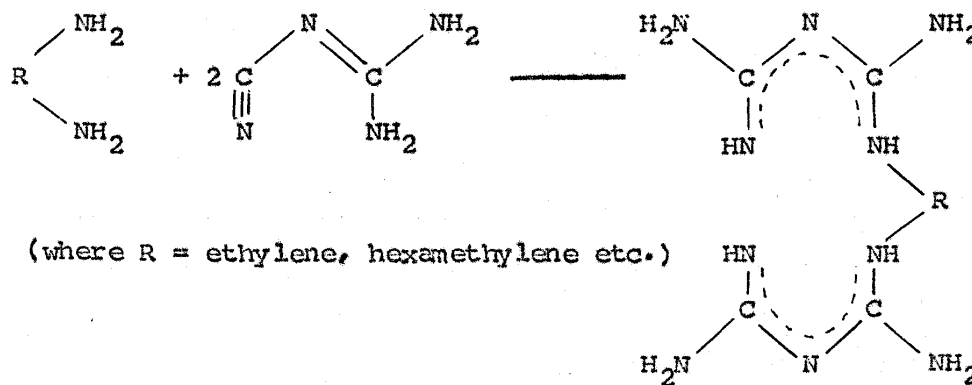
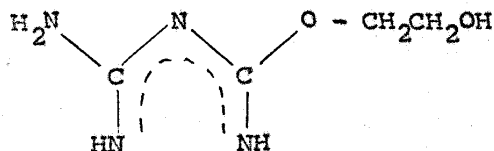


A. Introduction :

Synthesis, characterization and coordination behaviour of several dibiguanides of the general formula $R(C_2N_5H_6)_2$ (where R = ethylene, hexamethylene, m-phenylene, piperazine etc.) have been the subject of interest to chemists during the last few decades¹⁻⁵. This is, in part, due to their strong chelating behaviour towards transition metal ions. The extra stability of the metal chelates with these type of ligands has been attributed to their quadridentate nature. These class of chelating ligands have been synthesized by the reaction of different diamines with excess of dicyandiamide. The general reaction scheme for such type of reaction is given below.



Literature survey reveals the formation of ethylene-1-hydroxy-2-amidino-isourea by the reaction of one mole of dicyandiamide with one mole of ethylene glycol⁶.



No attempt has, however, been made to synthesize the ethylene-diamidinoisourea. In this chapter the synthesis and characterization of this ligand and its metal complexes with copper(II), nickel(II), cobalt(III) and silver(III) have been reported.

B. Experimental :

Ethylenedi-amidinoisourea sulphate

One mole of ethylene glycol (5.6 c.c) and two moles of dicyandiamide (17 gm) were heated together with continuous stirring on a water bath at a temperature of 75°C. Finely powdered copper sulphate (3 gm) was added to the melt in small portions and stirred thoroughly till the rose-red copper complex was formed. Bulky precipitate of rose-red copper complex was formed after continuous stirring with distilled water. It was filtered, washed thoroughly with distilled water and dried in a desiccator over fused CaCl_2 (yield - 15 gm).

The dried crude product was triturated thoroughly in an agate mortar with minimum volume of 1N H_2SO_4 till dissolution. On keeping in a refrigerator overnight beautiful needle shaped

white crystals of the ligand sulphate separated out. It was filtered and recrystallized twice from water and dried over fused CaCl_2 .

Found		$[\text{C}_2\text{H}_4(\text{C}_2\text{N}_4\text{H}_6\text{O})_2]\text{SO}_4 \cdot 2\text{H}_2\text{O}$ requires	
N	31.05	N	30.76
SO_4	26.58	SO_4	26.37

The ligand is highly soluble in water, sparingly soluble in methanol and insoluble in acetone.

Ethylenedi-amidinoisoureacopper(II) sulphate

The crude copper complex (6 gm) was dissolved in minimum amount of 1N H_2SO_4 . It was filtered and the filtrate treated with dilute ammonia till just ammoniacal. Beautiful rose-red precipitate of the copper complex appeared. The product was filtered and washed several times with distilled water and dried over CaCl_2 .

Found		$[\text{Cu}\{\text{C}_2\text{H}_4(\text{C}_2\text{N}_4\text{H}_5\text{O})_2\}]\text{SO}_4 \cdot 2.5\text{H}_2\text{O}$ requires	
Cu	14.19	Cu	14.62
N	26.01	N	25.77
SO_4	21.25	SO_4	22.09