



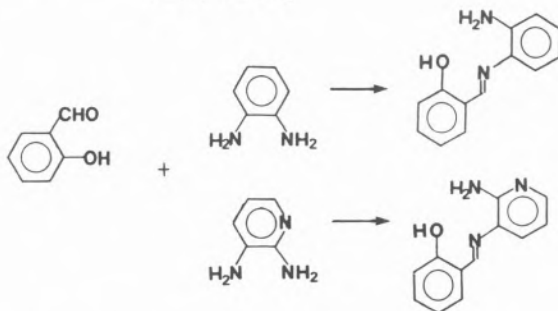
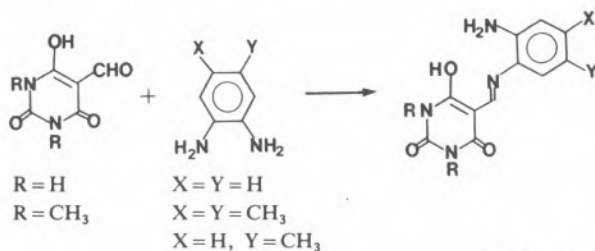
PS5.29 — TH

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### SYNTHESIS OF COBALT(II) COMPLEXES WITH NON-SYMMETRIC SCHIFF BASES

As models for oxygenases, we have undertaken the synthesis of copper and cobalt complexes with Schiff bases derived from pyrimidine bases [1-3]. In order to study the influence of the aromatic ring on the half-wave potentials and on their catalytic efficiency, we have prepared non-symmetric Schiff bases with aromatic diamines. Condensation of the carbonyl function with only one end of the diamine is obtained in the presence of a tertiary amine with 5-formyl barbituric acid, 5-formyl 1,3-dimethyl barbituric acid or with salicylaldehyde.



Further condensation of these half-units with various aromatic hydroxy aldehydes leads to non-symmetric Schiff bases.

The corresponding cobalt(II) complexes have been prepared and studied by usual spectroscopic methods. Their ability to catalyse the oxidation of phenols will be described.

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PS5.30 — MO

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### COORDINATION CHEMISTRY OF IRON BIS-PYRIDOXAL ISONICOTINOYL HYDRAZONE: STEREOCHEMICAL AND ELECTRO- CHEMICAL CONSIDERATIONS

Isoniazid can interact with the body pyridoxal to form pyridoxal isonicotinoyl hydrazone (PIH) shown to be an efficient iron chelator which can deplete the body of iron and cause an anemia («pyridoxine-responsive anemia»). It was identified recently as a promising candidate for removal of toxic accumulation of iron from the body when given orally [1]. This is an advantage over desferrioxamine (desferal) a drug in current use being administered by injection.

We report the synthesis and the X-ray crystal structure of a 2:1 PIH:Fe(III) complex which emerged from a neutral aqueous solution

(pH ~ 7.0) containing PIH and  $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ . It analyzed as a  $[\text{Fe}(\text{C}_{14}\text{H}_{14}\text{N}_4\text{O}_3)_2]_2\text{SO}_4$  crystalline compound of space group  $\text{C}2/c$ ,  $z=8$ ,  $a=14.487$ ,  $b=18.586$ ,  $c=27.508 \text{ \AA}$ , and  $v=7224 \text{ \AA}^3$ .

PIH is shown to function as a neutral tridentate ligand, forming a non-planar tricyclic system which comprises pyridoxal, an hexatomic and a pentatomic chelate rings with dihedral angles of  $13.01^\circ$  and  $8.45^\circ$ , respectively, between them. The coordination plane deviates from coplanarity, showing significant departure from the ideal octahedron. The hydrazidic central donor atoms are *trans* related to each other and the two phenolate and enolate oxygens mutually *cis*. The coordinated ligands retain the neutrality characteristic of its free form by a transfer of protons from the phenolic oxygens and the hydrazidic nitrogens to the pyridine nitrogens. The sulphate ion is a counterion [2]. The transition of  $\text{Fe(II)}$  to  $\text{Fe(III)}$  occurs even in presence of a strong reducing agent, suggesting that PIH lends itself to reversible two-stage redox reaction. This was fully corroborated by polarographic measurements, allowing its likening to «viologenes» of potential biological importance.

## REFERENCES

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PS5.31 — TU

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## MOBILIZATION OF FERRITIN-BOUND IRON BY REDUCED D,L-LIPOATE AND REDUCED D,L-LIPOAMIDE

The mobilization of ferritin-bound iron, an issue of great physiological and clinical relevance [1], was investigated by studying several iron chelators [2], either in the absence or in the presence of iron-reducing agents [3] and of activators of the removal process [4].

In the course of other studies, we noticed the unusual ease of formation and stability of a complex between iron(III) and D,L-dihydrolipoate (DHL-COOH). This complex was characterized to some extent and the tentative formula  $[\text{Fe}_2(\text{DHL-COO}^-)_4]^{-6}$  was attributed to it [5,6]. In view of the unusually high stability of this complex, of considerations about the amphiphilic nature of the ligand and about the molecular architecture of ferritin, we tested the ability of both DHL-COOH and D,L-dihydrolipoamide (DHL-NH<sub>2</sub>) in the mobilization of ferritin-bound iron.

Fig. 1 shows the electronic spectra obtained upon incubation of horse-spleen ferritin (HSF) with DHL-NH<sub>2</sub>, DHL-COOH and with dithiothreitol as a control dithiol. Progressive appearance of the spectral features of  $[\text{Fe}_2(\text{DHL-R})_4]^{(-6,-4)}$  is evident, whatever the amidation state of the ligand. DHL-NH<sub>2</sub> appears to react faster than DHL-COOH. Nevertheless, after 20 hours incubation, an identical absorbance at 620 nm was attained in both reactions. By assuming  $\epsilon_{620} = 4,000 \text{ (g atom iron)}^{-1}\text{cm}^{-1}$  for  $[\text{Fe}_2(\text{DHL-R})_4]^{(-6,-4)}$ , the amount of iron released