

Research Paper :

## Syntheses and anti-inflammatory activity of diphenyl-2,2'-Dicarboxylic acid and its metal complexes

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### ABSTRACT

Diphenyl amine-2,2'-dicarboxylic acid and its Cu(II), Ni(II), Co(II) and Zn(II) complexes have been synthesized and characterized by their elemental analyses, molecular weight determination, molar conductance, infrared and electronic spectra and magnetic measurements. The Zinc complex was tested by different methods for anti-inflammatory activity. It was found to be equipotent to Naproxen and Ibuprofen, though in higher doses.

**Key words :** Metal complex, NSAID'S, Prostaglandins, Anti inflammatory agent

Inflammation is a tissue response involving physiological, morphological and biochemical changes. Several highly bioactive chemical mediators like histamine, 5-HT, kinins, interleukin-1, hydrolytic enzymes and prostaglandin are released during the dynamic process, making the process more complicated.

Unfortunately, none of the non-steroid anti-inflammatory drug (NSAID'S) is devoid of high incidence of gastric ulceration and side effects on kidney, liver, bone marrow and skin. The discovery of Ibuprofen [2-(4-iodophenyl) propionic acid] in early sixties, triggered a new trend in the research of a non-steroid substituted aryl carboxylic acid derivative. Though they were less gastric irritant than other NSAID'S but their long term use do lead to the undesirable side effects. Therefore, there is still a need for a NSAID effective of Park Davis chemists that N-aryl anthranilic acid derivatives exhibit potent oral anti-inflammatory activity in UV erythema assay further stimulated the interest in this area.

Copper is known to suppress inflammation and to possess antiulcer properties<sup>1,2</sup>. Lower levels of Zinc have been found in patient of rheumatoid arthritis. They respond to Zinc supplementation<sup>3</sup> and Zinc possess antiulcer activity<sup>4</sup>. Gold salts are well known to alter course of rheumatoid arthritis and metals like Iron, Manganese, Zinc and Copper also have been shown to be concerned with the synthesis of procollagen, proelastin, mucopolysaccharide etc. which are necessary for healing following tissue damage.

In the quest for better tolerated NSAID, we synthesized diphenylamine-2,2'-dicarboxylic acid (DPDC)

and its metal complexes involving Cu(II), Ni(II), Co(II) and Zn(II) as metal ions. Their structures were established by using different physicochemical methods viz. elemental detection, molar conductance, molecular weight determination, electronic and infrared spectra and magnetic measurements. At the ligand and chelates were subjected to the primary screening against carrageenan induced rat oedema test. It was found that Zinc chelate was most active among all the compounds. Therefore, it was further investigated and the results are reported here.

### MATERIALS AND METHODS

All the chemicals used were of analytical reagent grade.

#### Synthesis of Diphenyl amine-2,2'-dicarboxylic acid (DPDC) :

Diphenylamine-2,2'-dicarboxylic acid (Fig. 1) was synthesized by condensing equimolar amount of 2-chlorobenzoic acid with anthranilic acid in the presence

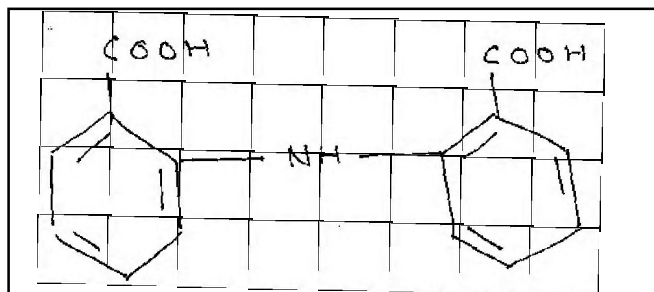


Fig. 1 : Diphenylamine-2,2'-dicarboxylic acid