Preparation, Characterization And Anti-Inflammatory Studies Some Life Essential metals with Diclofenac Potassium

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ABSTRACT:-

This paper deals with the study of life essential metals with diclofenac postassium. The conductivity, molecular weight, infrared, magnetic susceptibility and electronic spectra has been studied and the explanation of results has been shown as was found by the study.

Key Words:-

Diclofenac potassium, methanol, Gastric lesion, Anti-inflammatory drug, Carrogecnan Newbeuld, analgesic antipyretic.

INTRODUCTION:-

Diclofenac has analgesic, anti-inflammatory and antipyretic properties, all related to it supervision of the cycloonygenase (Cox01 and Cox-2) activities. Its profile of adverse effects is similar to other NSAD's with gastro-intestinal and renal complications being the most common and some times making it necessary to interrupt treatment. Quantity of the drug for children and other diseased persions in various cases of disease has little role with used drug. methatrereat and cyclosporine. Diclofenac main indications are for the treatment of osteoarthritis symptomate treatment of rheumatic disease, cancer pain as an adjustment of opioid therapy, musculosreletal condition, headache and postoperative pain[1].

Complexes of Diclofenac potassium an anti-inflammatory drug with Cu(II), Fe(II), Ni(II) and Zn(II) has been synthesised and properties has been studied by molecular conductance, magnetic moment and spectral measurement and I.R. measurement , bidentate anionic ligand. Anti-inflammatory effect has been evaluated by carrageen an induced rat paw edema test.

The Fe (II) complexes were found less active than the parent drug while the complexes of Ni, Cu, and Zn were found more potent than their basic drugs.

Diclofenac potassium is a analgesis as well as anti-inflammatory drug.

Experimental :-

Chemical were used A.R. Grade. The Complex of potassisum has been contributed by A.P.C.P. Pharma Limited Haridwar and used as such.

Preparation of Complexes:-

The stoichlometric ratio of the complexes were determined by spectrophotometrics conductometric method. Divalent forms of complexes were isolated from methand. To a hot soln of the ligand in the same solvent in ratio M:L::1:2 were added and boiled for 5-10 hours. A regular pH of the Solution i.e. 5-10 was established throughout the experiment, using either NH_3or Hcl during the process. The complexes were purified and dehydrated by the ususal process taking methanol as a solvent and anhydrous desicator. The purity of complexes were correctrised by T.L.C..

To characterised the complexes the physical properties for example melting point was determine by the usual process.

Raste campher method was used by us for the molecular weight determinations. Elemental analysis were carried out on a Heraeus Carlo Erba 1108 analyzer. The impurity like sulphate and metals were determined by usual method. The I.R. Spectra were determine by Varian 3100F.T. infrared spectrophotometer in KBr between range 200-4000cm-1. Electronic spectra were recorded on Shimadzu 210Å UV/Lis spectrophotometer. Elico CM 82T was used for the determination of molar conductance. Magnetic suscetability of the complexes were determined by using $CuSO_4$. SH_2O as calibrant.

Result and Discussion:-

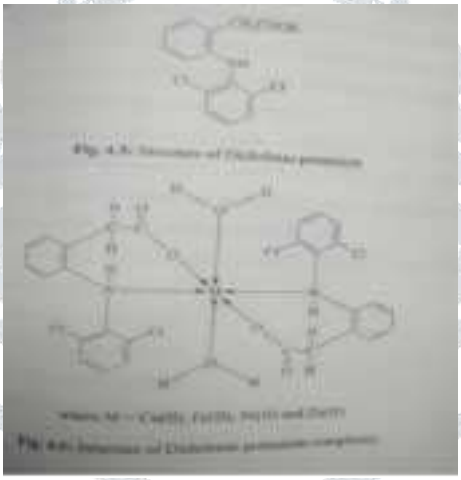
The observe data were shown in the table No-1. All complexes are non-electrolyte in nature.

The complexes were bi-Polar in nature and Zn Comlex was found dia-magnetic while others paramagnetic. The molar conductance in DMF of Cu(II), Fe(II), Ni(II) and Zn(II) complexes is 97, 93, 98, 99, respectively indicate 1:2 electrolyte in nature. The [Cu (C_{14}, H_{10}, Cl_2 $NO_2)_2$ $2H_2O$] is aquamarine, [Fe (C_{14} H_{10} Cl_2 $NO_2)_2$ $2H_2O$] is dark brown, [Ni (C_{14} H_{10} Cl_2 $NO_2)_2$ $2H_2O$] is light green, [Zn (C_{14} H_{10} Cl_2 $NO_2)_2$ $2H_2O$] is white.

A comparison of the infrared spectral data of the ligand and their complexes indicate the following changes. The ligand shows characteristic frequency due to ν_{N-H} at 3400-3200 cm^{-1} and ν_{C-O} at 1660-1640 cm^{-1}. The spectra of Cu(II), Fe(II), Ni(II) and Zn(II) show shifting of N-H and CO stretching bonds indicating the coordination through these group. The ν_{M-OH} bending band at 940-935cm^{-1} in aqua complexes of Cu(II), Fe(II), Ni(II) and Zn(II) indicating the presence of coordinated aqua molecule in the complex.[10]

All the complexes show broad bands 3600-3400cm^{-1} by medium peaks at 940-935cm^{-1} assignable. The presence of H_2O molecules co-ordination was observed as usual

The UV and visible spectra of Cu(II) Fe(II) and Ni(II) exhibit two bands at 289, 280nm 371, 364nm and 335-324nm respectively. These bonds may be assigned as charge transfer bond may be M→L or L→M. However no absorption occur in the Zn(II) complexes having d^{10} configuration. This on the bases of aforesaid discussion the following tentative octahedral structure may be assigned.



Anti-inflammatory Activity:-

Salicylic acid is a phenyl derivative and has anti-infommatory, antepyretic and analgesic action. Mainly its is used for the treatment of rheumatie, arthritis and rheumatoid disorder. The Complexes of salicylic acid mainly with Cu and Fe Complexes shows better activity than the other-complexes.

Table-2 shows the anti imflammatory activity of salicylic acid and its complexes. The results shows that activity salicylic acid increases with the Zn and Cu, while decreases with the Ni and Fe Complexes.

Table-1

Characterization Data of the complexes

Complex/ colour/ m.pt.^{0}c	Molecular weight found (calculated)	Found/ (Calculated) %					left B.M.	Am II^{-1} cm^{-2} met^{-2}
		M	C	H	N	G		
[Cu($C_{14}H_{10}Cl_2NO_2$)$_2$.2H_2O]	689.55	9.21	48.72	2.90	4.06	20.60	1.97	97
Aqua marins, 128		(9.19)	(48. 70)	(2.88)	(4.04)	(20.58)		
-[Fe($C_{14}H_{10}Cl_2.O_2$)$_2$.2H_2O]	664.90	8.41	50.53	3.01	4.21	21.36	5.81	93
Dark Brown, 180		(8.40)	(50.50)	(3.00)	(4.23)	(20.36)		
-[Ni($C_{14}H_{10}NCl_2O_2$)$_2$.2H_2O]	684.70	8.57	49.07	3.51	4.09	20.74	5.86	98
Light green, 230		(8.54)	(40.04)	(3.48)	(4.07)	(20.70)		
-[Zn($C_{14}H_{10}NCl_2O_2$)$_2$.2H_2O]	691.39	9.46	48.60	3.47	4.05	20.54	Diama gnetic	99
White, 120		(9.42)	(48.58)	(3.45)	(4.01)	(20.50)		

Table-2

Anti-Inflammatory Activity of Diclofenac Potassium and its complexes

Compound	No. of Animals used in each group	Dose (mg/Kg) body wt.	Initial volume (0.0 hrs)	Final volume after 3.0 hrs	Volume of edeing (final-initial)	% inhibition
Control	10	100	0.610	1.140	0.530	
Plain drug	10	100	0.682	0.995	0.313	40.84
Fe-drug complex	10	100	0.810	1.640	0.354	33.20
Ni-drug complex	10	100	0.830	1.400	0.310	41.50
Cu-drug complex	10	100	1.006	1.176	0.170	67.92
Zn-drug complex	10	100	0.729	0.909	0.180	66.03

* *- Average of 5 reading

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