

Figure 2. The DCS results at incident energy 200 eV. The references are same as in figure 1.

and Latour<sup>6</sup>, and it is observed that there is very nice agreement at all angles. These results are displayed in figure 3.

We conclude that the present results will be improved at higher incident energies and the inclusion

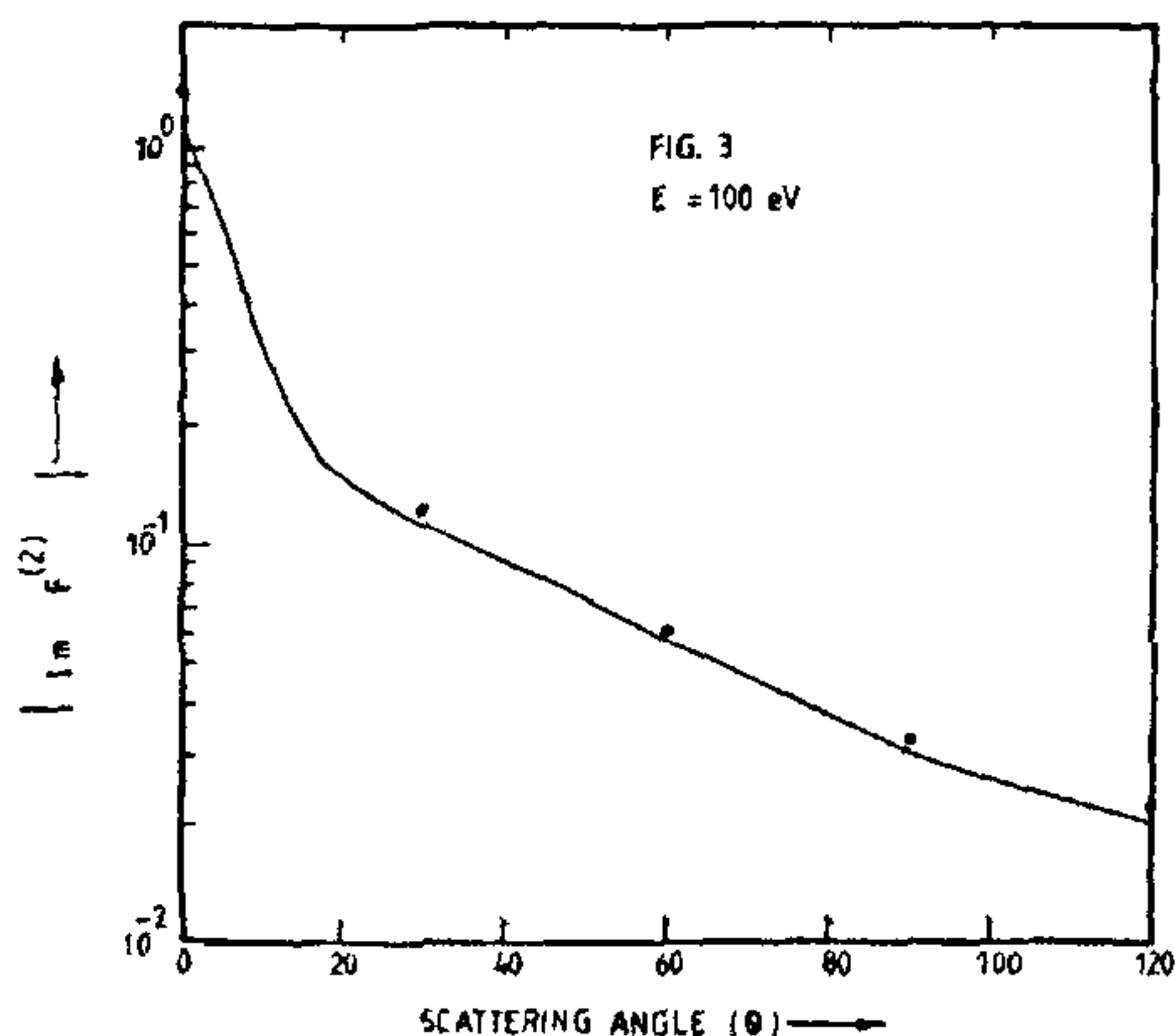


Figure 3. Comparison of present imaginary part and the imaginary part of Byron and Latour<sup>6</sup> at incident energy 100 eV.

of third Born term<sup>1</sup> instead of third GES<sup>5</sup> will improve our results over the entire angular range.

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### BINUCLEAR Ni(II), Co(II), Cu(II), VO(II) and Pt(II) CHELATES OF SCHIFF BASES.

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THE binuclear metal chelates of Ni(II), Co(II), Cu(II), VO(II) and Pt(II) with *o*-(- $\alpha$ -pyridoneimino) propanoic acid (H<sub>2</sub>PP) and *o*-(- $\alpha$ -pyridoneimino) benzoic acid (H<sub>2</sub>PB) have not been studied so far. An attempt has been made to investigate these metal chelates and to study their magnetic behaviour. The results obtained are reported in the present communication.

All the solvents and reagents used were of AnalaR grade and used without further purification. The instruments employed were the same as reported earlier<sup>1</sup>.

**Preparation:** *o*-(- $\alpha$ -pyridoneimino) propanoic acid (H<sub>2</sub>PP) and *o*-(- $\alpha$ -pyridoneimino) benzoic acid (H<sub>2</sub>PB): A mixture of an ethanolic solutions of  $\alpha$ -pyridone (0.01 mole) and  $\beta$ -alanine (0.01 mole) or anthranilic acid (0.01 mole), were refluxed for 1-2 hr in presence of a drop of piperidine as a condensing agent. The resulting solid mass was filtered while hot, washed with ethanol and dried in a vacuum desiccator

TABLE I

Yield, molecular weight, magnetic moment and conductance data of H<sub>2</sub>PP and H<sub>2</sub>PB binuclear metal chelates.

Compound	Yield (%) colour	Mol. wt. Found (calc.)	Decomposition Temp. °C	$\mu_{\text{eff}}$ (BM) at 308° K	Conductance ohm <sup>-1</sup> mole <sup>-1</sup> cm <sup>2</sup>
[Co <sub>2</sub> (PP) <sub>2</sub> ]	73 Chocolate Red	391 (408)	278	4.12	3.58
[Cu <sub>2</sub> (PP) <sub>2</sub> ]	75 Blue	402 (427)	310	0.68	4.22
[VO <sub>2</sub> (PP) <sub>2</sub> ]	78 Mint green	410 (434)	290	1.55	4.12
[Pt <sub>2</sub> (PP) <sub>2</sub> ]	62 Dark brown	678 (690)	325	diamagnetic	3.21
[Ni <sub>2</sub> (PP) <sub>2</sub> ]	82 Dark green	407 (417)	282	diamagnetic	3.96
[Co <sub>2</sub> (PB) <sub>2</sub> ]	68 Brick Red	448 (456)	280	4.09	3.50
[Cu <sub>2</sub> (PB) <sub>2</sub> ]	71 Greenish Blue	462 (475)	300	0.63	4.30
[VO <sub>2</sub> (PB) <sub>2</sub> ]	72 Dark green	479 (482)	288	1.59	4.02
[Pt <sub>2</sub> (PB) <sub>2</sub> ]	77 Dark brown	726 (738)	340	diamagnetic	3.12
[Ni <sub>2</sub> (PB) <sub>2</sub> ]	83 Bottle green	452 (465)	328	diamagnetic	3.92

where (PB)<sub>2</sub> = (C<sub>18</sub>H<sub>12</sub>N<sub>4</sub>O<sub>4</sub>); and (PP)<sub>2</sub> = (C<sub>14</sub>H<sub>12</sub>N<sub>4</sub>O<sub>4</sub>).

at 35-37°/0.01 mm/1 hr: The yield was found quantitative.

**Metal Chelates:** Hot ethanolic solutions of H<sub>2</sub>PP or H<sub>2</sub>PB and metal acetates were refluxed over an oil-bath for 2-3 hr. On cooling, the solid separated, was filtered and recrystallized from ethanol dried and preserved in a vacuum desiccator.

The compounds are all stable powders insoluble in water as well as in acetone and nitrobenzene. The colour, yield, molecular weight, conductance and magnetic moments are presented in table I.

The solid chelates thus obtained were characterized using various techniques including molecular weight determination and elemental analyses. These results show that the chelates possess 1:1 (metal:ligand) stoichiometry and exist as dimers in the solid state. The conductance data indicate weak electrolytic nature of the chelates.

The magnetic moments are quite interesting and are much lower than those of the usual mononuclear chelates at 308° K. The sub-normal magnetic moments reveal the existence of antiferromagnetic interactions.

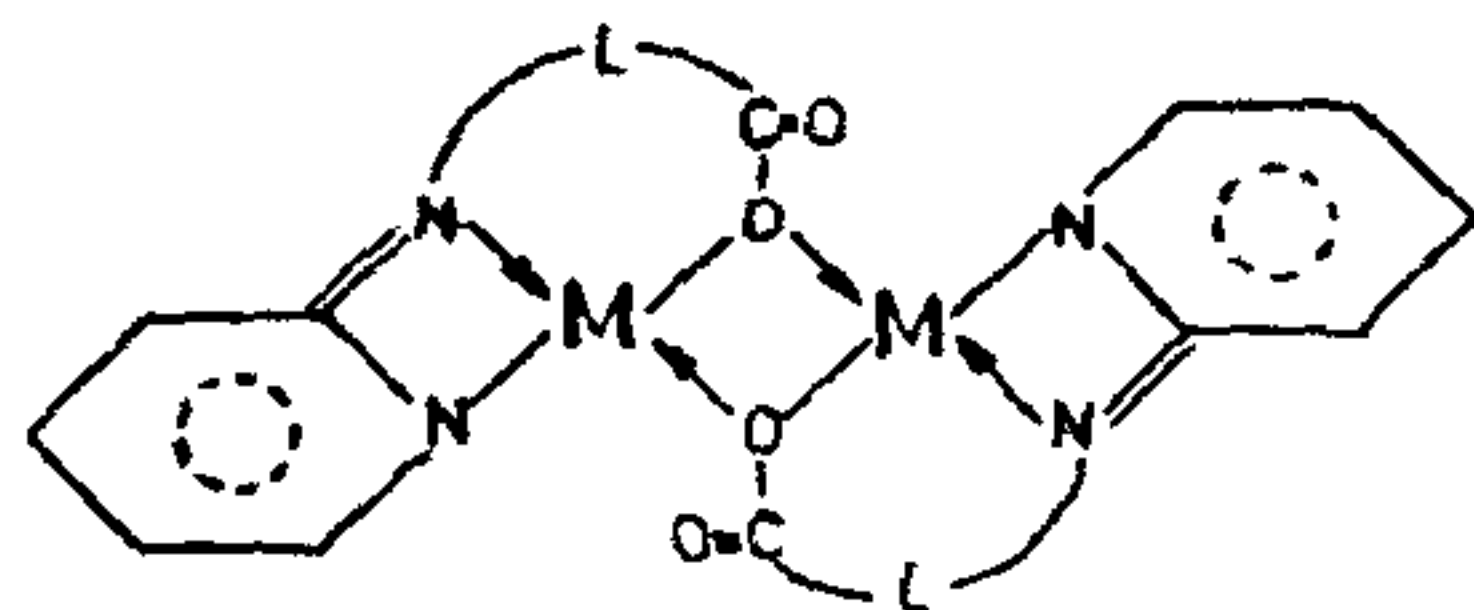
The magnetic moments of Cu(II) chelates were found to be 0.68 and 0.63 BM and those of VO(II) were 1.55 and 1.59 BM. In Co(II) chelates the lowering in magnetic moments to 4.12 and 4.09 BM is attributed to antiferromagnetism via a super exchange mechanism.

The Pt(II) and Ni(II) chelates were found diamagnetic, as expected.

The relative decrease in magnetic moments at 308° K is in the order Cu(II) > VO(II) > Co(II). All the chelates have similar structure but different magnetic behaviour. However, the electronic symmetry is supposed to play an important role in order to explain the strength of interactions in binuclear chelates.

**IR Spectra:** The IR spectra of H<sub>2</sub>PP and H<sub>2</sub>PB show three bands in the regions 3315-3325 cm<sup>-1</sup>, 1620-1635 cm<sup>-1</sup> and 2730-2740 cm<sup>-1</sup> attributed to  $\nu_{\text{NH}}$ ,  $\nu_{\text{C=N}}$  and  $\nu_{\text{COOH}}$  respectively. In all the metal chelates the bands in the region 2730-2740 cm<sup>-1</sup> disappeared due to participation of carboxylate group in the chelates. The study of bands in the carbonyl region of metal chelates produced no evidence of antisym-





WHERE  $M = \text{Co(II)}, \text{Cu(II)}, \text{VO(IV)}, \text{Pt(II)} \text{ OR } \text{Ni(II)}$ ;  
 $L = -\text{CH}_2\text{CH}_2-(\text{H}_2\text{PP}) \text{ OR } \text{C}_6\text{H}_5-(\text{H}_2\text{PB})$

**Figure 1.** Bivalent metal chelates of  $o(\alpha$ -Pyridonemino) propanoic acid ( $\text{H}_2\text{PP}$ ) and  $o(\alpha$ -Pyridoneimino) benzoic acid ( $\text{H}_2\text{PB}$ ).

metric  $\text{COO}^-$  stretching vibrations and has shown the presence of localized  $-\overset{\text{O}}{\parallel}{\text{C}}-\text{O}-\text{Cu}$  structure, which shows carbonyl stretches in the  $1660-1680 \text{ cm}^{-1}$  range<sup>1</sup>.  $\text{cm}^{-1}$  range<sup>2</sup>.

Based on analytical, spectral and magnetic studies these chelates may be represented by structure as shown in figure 1.

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## A CHEMICAL EXAMINATION OF THE FUNGUS *STEREUM ELEGANS* RICH IN ERGOSTEROL

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DURING the chemical investigation of the wood-rotting fungi, a fungus growing under the shade of AONLA (*Emblice officinalis* Gaertn. syn. *Phyllanthus emblica* L.) trees was noticed on the lawns of the Safdarjung Tomb in South Delhi. It was identified as *Stereum elegans* by the Forest Research Institute, Dehra Dun (Specimen No. 8444, as incorporated in FRI Herbarium). The fungus has a flower-like physical appearance.

*Stereum* is a genus belonging to Friesian family, Thelephoraceae, which has about 900 species in 33 genera. About 100 species have been described under this genus<sup>1</sup>. Some of the species of *Stereum* have been examined earlier for their chemical components<sup>2-6</sup> which mainly belong to the groups of sesquiterpenes, benzofurans, proteins, polysaccharides and polyacetylenes.

In the present work, *S. elegans* has been extracted successively with light petroleum and acetone. The light extract on concentration and cooling yielded ergosterol (0.17% yield). The mother liquor was a complex mixture of small amounts of compounds which could not be separated even by chromatography. The acetone extract on concentration and subsequent extraction with benzene gave more of ergosterol (0.04%). Ergosterol is thus reported for the first time from *Stereum* genus and the present species seems to be a good source.

### Experimental part

The air-dried fungus (100 g) was extracted exhaustively with light petroleum and acetone in succession in a Soxhlet apparatus for 6 hr each. The light petroleum extract was concentrated and cooled when a colourless solid separated out. It was crystallised twice from light petroleum when ergosterol was obtained as needle shaped (170 mg). The identity was confirmed by m.p. and m.m.p. with an authentic sample  $163^\circ$  (lit. m.p.  $163^\circ$ ), TLC:  $R_f$  in  $\text{CHCl}_3$  0.35 IR, NMR and mass spectra were superimposable with those of the authentic sample. Further, it formed an acetate giving colourless crystals, m.p.  $176^\circ$  (lit. m.p.  $176^\circ$ ).

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