The complexes are sparingly soluble in water and common organic solvents. They behave as non-electrolytes in nitromethane. In all these complexes the ligand functions as a dibasic ONNO pair occupying the apex of the square-pyramid.

Acetylacetone reacts with two moles of benzoyl hydrazide to provide the rather unusual schiff base \( \text{N,N'-bis(benzamido)acetylacetoneiminocadmiumdls,} \) \( \text{CdL}_2\text{H}_2\text{O} \) which was prepared following published procedures. \( \text{K}_2\text{PtCl}_4 \) was a product of MIS. Johnson Matthey.

For the estimation of metal ion content, the zinc(II), cadmium(II) and oxovanadium(IV) complexes were ignited to the respective oxides. The platinum(II) complex was ignited to metallic platinum. The lead(II) complex was first decomposed by heating with dilute nitric acid and finally lead was estimated as lead sulphate. Nitrogen was determined by Duma's method (Table 1). The infrared spectra were recorded in KBr on a Beckman Acculab-10 spectrophotometer. Magnetic moment of the oxovanadium(IV) complex was determined using a Gouy balance with CuSO_4·5H_2O

Table 1 — Analytical Data of the Ligands and the Metal Complexes

<table>
<thead>
<tr>
<th>Compound (Colour)</th>
<th>Found (Calc.), %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
</tr>
<tr>
<td>LH_2 (White)</td>
<td>16.6</td>
</tr>
<tr>
<td>PbL (White)</td>
<td>38.1</td>
</tr>
<tr>
<td>ZnL (White)</td>
<td>16.6</td>
</tr>
<tr>
<td>CdL2H_2O (Light-yellow)</td>
<td>23.6</td>
</tr>
<tr>
<td>PtL (Light-black)</td>
<td>36.3</td>
</tr>
<tr>
<td>VOL (Light-gray)</td>
<td>12.4</td>
</tr>
</tbody>
</table>

The rather unusual schiff base \( \text{N,N'-bis(benzamido)acetylacetoneiminooxovanadium(IV),} \) \( \text{[VOL]} \). The infrared spectra of the ligand and the complexes indicate that the ligand coordinates in the enol form. The vC = O and the vNH modes of the free ligand at 1660 and 3280 cm\(^{-1}\) respectively are absent in all the complexes. The \( \text{[PbL]} \) complex probably has a square-pyramidal structure with the lone pair occupying the apex of the square-pyramid.
as the calibrant. Carbon and hydrogen estimations were done at CDRI, Lucknow.

All the complexes are found to be non-electrolytes in nitromethane and DMSO. This indicates that the complexes are electrically neutral and are formed by the enolisation of the ligand followed by deprotonation in the presence of the metal ions studied. Structure (I) may be assigned to the complexes. The water of hydration in the cadmium(II) complex is readily lost at 110°C.

\[
\begin{align*}
&\text{CH}_3 \quad \text{C} = \text{N} \quad \text{N} = \text{C} \quad \text{C}_6 \text{H}_5 \\
&\text{H}_2 \text{C} \quad \text{M} \quad \text{O} \\
&\text{C} = \text{N} \quad \text{N} = \text{C} \quad \text{C}_6 \text{H}_5 \\
&\text{CH}_3 \\
M &= \text{Pb}^{2+}, \text{Zn}^{2+}, \text{VO}^2 +, \text{or } \text{Pt}^{2+}
\end{align*}
\]

The infrared spectrum of the ligand shows characteristic sharp bands at 3280, 1660 and 1605 cm\(^{-1}\) due to \(\nu NH\), \(\nu C=O\) and \(\nu C=N\) modes respectively. These band positions corroborate the results reported earlier\(^1\). In all the complexes the NH stretch completely disappears as also the amide-I band, \(\nu C=O\). The \(\nu C=N\) is lowered substantially to around 1500 cm\(^{-1}\) (Table I). The infrared evidence confirms that the ligand gets enolised and then deprotonated, and thus functions as a quadridentate dibasic ONNO donor. The oxovanadium(IV) complex shows an additional sharp band at 995 cm\(^{-1}\) which confirms the presence of \(V=O\) in the complex\(^3\). The cadmium(II) complex exhibits a broad band over the range 3400-3600 cm\(^{-1}\) indicating the presence of coordinated water. Taking the available data into account, we formulate the platinum(II) complex as square-planar [Pt(ONNO)] and the oxovanadium(IV) complex as square-pyramidal [VO(ONNO)]. As expected for a 3\(d^1\) system, the complex registers a moment of 1.7 B.M. There are three absorption bands\(^4\) in the nujol mull spectrum at 16 kK\((d_{xy} \rightarrow d_{xy})\), 22 kK\((d_{xy} \rightarrow d_{sz} - p\) (shoulder) and 27 kK\((d_{xy} \rightarrow d_{zx})\). The lead(II) complex, as revealed by a study of the model, is best represented as a square-pyramidal complex with the lone pair occupying the vertex of the square-pyramid.

We thank Sri Subrata Laskar for kindly running the infrared spectra of the samples.

References