TABLE II
Sucinic dehydrogenase activity in various tissues in normal and orthene injected rats

<table>
<thead>
<tr>
<th>Groups</th>
<th>No. of animals</th>
<th>Experimental period of weeks</th>
<th>Liver</th>
<th>Heart</th>
<th>Kidney</th>
<th>Brain</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>8</td>
<td>0</td>
<td>1.58 ± 0.002</td>
<td>0.76 ± 0.001</td>
<td>1.75 ± 0.003</td>
<td>1.02 ± 0.002</td>
</tr>
<tr>
<td>II</td>
<td>10</td>
<td>8</td>
<td>0.99 ± 0.001</td>
<td>0.50 ± 0.001*</td>
<td>1.01 ± 0.002</td>
<td>0.72 ± 0.004</td>
</tr>
<tr>
<td>III</td>
<td>10</td>
<td>8</td>
<td>1.59 ± 0.010</td>
<td>0.79 ± 0.002</td>
<td>1.78 ± 0.010</td>
<td>1.08 ± 0.030</td>
</tr>
</tbody>
</table>

*P < 0.01.

toxicity influences the bodily requirements of the vitamin may be inferred from the protection offered by extra riboflavin administration against the poisonous effects of selenium\(^{15}\) and lead\(^{16}\). In our present investigation the animals injected with orthene showed depletion of riboflavin and lower activity of SDH in different tissues. The animals receiving riboflavin injection along with orthene showed nearly normal level riboflavin and SDH activity in tissues indicating thereby that orthene increases the requirement of riboflavin of albino rats.

October 1, 1980.


5-COORDINATE OXOVANADIUM(IV) COMPLEXES WITH MONOFUNCTIONAL TRIDENTATE SCHIFF BASES CONTAINING O, N, O- SEQUENCES

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Department of Chemistry, Gulbarga University Gulbarga 585 105, Karnataka, India

The transition metal complexes with tridentate Schiff bases have been well investigated during the past two decades\(^{1-8}\). However, only recently the attention has been directed to the complexes of the transition metals with monofunctional tridentate Schiff bases containing -O,N,O- and -O,N,S-sequences\(^{8-8}\). In this communication, we describe the synthesis and spectral studies of oxovanadium(IV) complexes with the Schiff bases I-IV.
Experimental

The ligands I-IV were prepared as reported earlier. To a mixture of methanilanthranilate (0.015 M) and aldehyde (0.015 M) in alcohol was added vanadyl sulphate (0.01 M) in alcohol and refluxed for an hour. Then about 2 g of sodium acetate were added and refluxed for a couple of hours. The reaction mixture was cooled and filtered. The pH of the filtrate was adjusted to about 8 with ammonia solution with vigorous stirring. The bluish green precipitate of the complex obtained was filtered, washed thoroughly with ethanol and dried in vacuum over fused calcium chloride. The metal and nitrogen contents in these complexes were analysed.

Results and Discussion

Nature and Stoichiometry

The elemental analyses indicate 1:1 stoichiometry for these oxovanadium(IV) complexes. The complexes are bluish green in colour and insoluble in common organic solvents. The complexes obtained from the Schiff bases I, II, III and IV are indicated as V, VI, VII and VIII.

Infrared Spectra

The infrared spectra of the ligands and the complex in Nujol mull were recorded on Perkin-Elmer 257 spectrometer. Some important bands are shown in Table I. These reveal that the ligands under consideration coordinate to the oxovanadium(IV) through all the coordinating sites and hence exhibit monofunctional tridentate behaviour.

Magnetic Moments

The magnetic susceptibility values obtained at room temperature on a Gouy balance are listed in Table I. Hg[Co(SCN)₄] was used as a calibrant.

The magnetic moments of these complexes are very close to the spin only value of 1.73 B.M. expected for monomeric oxovanadium(IV) complexes. Such oxovanadium(IV) complexes acquire pyramidal structure.

Electronic Spectra

The electronic spectra of the complexes in DMSO have been measured on an ELICO CL-24 spectrophotometer operating in the range of 340-900 nm. The observed λ max values, the ligand field parameters and NSH parameters are listed in Table II.

The extent of distortion prevailing in the complexes has been calculated by applying NSH Hamiltonian theory of Lever and Coworkers

\[ DT = \frac{3\sqrt{15}}{2}Dt \]
\[ DQ = \frac{(6\sqrt{21})Dq}{2} - \frac{3\sqrt{21}}{2}Dt \]

and \[ DT/DQ \].

The 10 Dq values decrease from complexes V to VIII suggesting that there is increase in the steric hindrance due to the increasing size of the ligand. The ratio \[ DT/DQ \] is a measure of tetragonal distortion. The values calculated for these complexes are in the range of 0.304-0.334. The value reported for a limiting case of tetragonally distorted molecule is 0.4226. The ratio \[ DT/DQ \] calculated for the oxovanadium(IV) complex having C₄ᵥ symmetry is 0.377. The values

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Assignment</th>
<th>Complex V</th>
<th>Complex VI</th>
<th>Complex VII</th>
<th>Complex VIII</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>H bonded OH stretch</td>
<td>(1655) m</td>
<td>(1655) m</td>
<td>(1655) m</td>
<td>(1625) m</td>
</tr>
<tr>
<td>2.</td>
<td>C=O stretch</td>
<td>(1610) s</td>
<td>(1620) s</td>
<td>(1610) s</td>
<td>(1600) s</td>
</tr>
<tr>
<td>3.</td>
<td>C=N stretch</td>
<td>(1535) s</td>
<td>(1540) s</td>
<td>(1525) s</td>
<td>(1580) s</td>
</tr>
<tr>
<td>4.</td>
<td>Aromatic C=C stretch</td>
<td></td>
<td>(1310) s</td>
<td>(1305) s</td>
<td>(1310) s</td>
</tr>
<tr>
<td>5.</td>
<td>Phenolic C O stretch</td>
<td>(1265) s</td>
<td>(1270) m</td>
<td>(1255) m</td>
<td>(1245) m</td>
</tr>
<tr>
<td>6.</td>
<td>–O–C–O– stretch</td>
<td>(1030) brm</td>
<td>(1040) brm</td>
<td>(1040) brm</td>
<td>(1030) brm</td>
</tr>
<tr>
<td>7.</td>
<td>(V)=O stretch</td>
<td>(980) s</td>
<td>(980) s</td>
<td>970 s</td>
<td>970 s</td>
</tr>
<tr>
<td>8.</td>
<td>(V)=O stretch</td>
<td></td>
<td>(980) s</td>
<td>(980) s</td>
<td>(970) s</td>
</tr>
<tr>
<td>9.</td>
<td>A band appearing at 3,300 is assigned to a new OH bound to vanadium through oxygen (reaction at pH 8) in all the complexes.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>(\mu_{eff}) (B.M.)</td>
<td>1.75</td>
<td>1.68</td>
<td>1.67</td>
<td>1.76</td>
</tr>
</tbody>
</table>

s = strong, m = medium, brm = broad medium.
TABLE II

Electronic spectral band maxima and ligand field parameters of oxovanadium(IV) complexes with salicylidene methyl anthranilates

<table>
<thead>
<tr>
<th>Complex</th>
<th>$d_{2g} \rightarrow d_{2g}$</th>
<th>$d_{2g} \rightarrow d_{2g}$</th>
<th>$d_{2g} \rightarrow d_{2g}$</th>
<th>$D_{cm}^{-1}$</th>
<th>$D_{cm}^{-1}$</th>
<th>$D_{cm}^{-1}$</th>
<th>$D_{cm}^{-1}$</th>
<th>DT</th>
<th>DT/DQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>V</td>
<td>12,821</td>
<td>18,519</td>
<td>25,641</td>
<td>1852</td>
<td>-2849</td>
<td>855</td>
<td>37,206</td>
<td>11,582</td>
<td>0.311</td>
</tr>
<tr>
<td>VI</td>
<td>13,060</td>
<td>18,250</td>
<td>25,550</td>
<td>1825</td>
<td>-2892</td>
<td>863</td>
<td>38,473</td>
<td>11,736</td>
<td>0.304</td>
</tr>
<tr>
<td>VII</td>
<td>13,333</td>
<td>18,180</td>
<td>25,641</td>
<td>1818</td>
<td>-2970</td>
<td>884</td>
<td>35,808</td>
<td>11,978</td>
<td>0.324</td>
</tr>
<tr>
<td>VIII</td>
<td>13,333</td>
<td>18,018</td>
<td>26,316</td>
<td>1802</td>
<td>-3092</td>
<td>818</td>
<td>36,426</td>
<td>11,083</td>
<td>0.304</td>
</tr>
</tbody>
</table>

obtained for our complexes are also in the vicinity of the above value.

September 8, 1980.

5. Selbin, J., Ibid., 1966, 1, 293.

MIXED LIGAND COMPLEXES INVOLVING DIETHYLENE TRIAMINE AND LEUCIN

J. K. Shrestha
Department of Chemistry, Tribhuvan University, Kirtipur, Kathmandu, Nepal, India

Mixed ligand complexes involving amino acids and ammonia1 or different polyamines6,8 have been widely studied. The possibilities of the formation of different isomers of the mixed ligand complexes involving diethylenetriamine and amino acids are noted by Legg and coworkers5. Some of the mixed ligand complexes of cobalt(III) involving diethylenetriamine and amino acids like glycine, valine, I-threonine, etc., were also reported6. We have also reported a number of mixed ligand complexes of Co(III) with diethylenetriamine and different amino acids8. The present study is in continuation of this work.

Preparation of [Co(dien)(Leu)Cl]NO3

[Co(dien)Cl]2 was prepared by a method similar to that of Crayton7. [Co(dien)Cl]2 (~0.05 M) was added to 50 ml of water and to it 1.0 g of activated charcoal was added, the mixture was heated to about 60–70°C and stirred. Heating was continued for 15 minutes and then 2.4 g (~0.01 M) of silver salt of Leucin was added in small portions in an interval of 10 minutes. The mixture was stirred for 15 minutes and to it 1.7 g AgNO3 in 10 ml of water was added dropwise for 5 minutes. The mixture was cooled, filtered, and concentrated to about 20 ml. On cooling, dark brown crystals appeared. It was filtered, washed with 50% EtOH, acetone, and dried (yield 0.3 g).

Found C 30.62, H 6.50, N 17.82, Co 14.89, Cl 9.01

[Co(dien)(Leu)Cl] NO3 requires C 30.78, H 6.41, N 17.96, Co 15.09, Cl 9.10%.

Preparation of [Ni(dien) (Leu)] NO3

[Ni(dien)Cl]2 Cl was prepared by the literature method8. The preparation of this complex was similar