TABLE II

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

| Complex N.  | $d_{eg} \rightarrow d_{g}$ | $d_{eg} \rightarrow d_{eg}$ | $e_{g} \rightarrow d_{g}$ | $D$ cm$^{-1}$ | $D$ cm$^{-1}$ | $D$ cm$^{-1}$ | $D_{2g}$ | $DT$ | DT$\Delta Q$
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></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>13,233</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.


MIXED LIGAND COMPLEXES INVOLVING DIETHYLENE TRIAMINE AND LEUCIN

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Mixed ligand complexes involving amino acids and ammonia\(^1\) or different polyamines\(^2\,\(^3\) 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 coworkers\(^4\). Some of the mixed ligand complexes of cobalt(III) involving diethylenetriamine and amino acids like glycine, valine, l-threonine, etc., were also reported\(^5\). We have also reported a number of mixed ligand complexes of Co(III) with diethylenetriamine and different amino acids\(^6\). The present study is in continuation of this work.

**Preparation of [Co(dien)(Leu)]\(\text{ClNO}_3\)**

[Co(dien)Cl\(_2\)] was prepared by a method similar to that of Crayton\(^7\). [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 AgNO\(_3\) 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% LiOH, acetone and dried (yield 0.3 g).

Found: C 30.62, H 6.30, N 17.82, Co 14.89, Cl 9.01. [Co(dien)(Leu)]\(\text{ClNO}_3\) requires C 30.78, H 6.41, N 17.96, Co 15.09, Cl 9.10%.

**Preparation of [Ni(dien) (Leu)]\(\text{NO}_3\)**

[Ni(dien)Cl\(_2\)] Cl was prepared by the literature method\(^6\). The preparation of this complex was similar...
TABLE 1
Visible spectral data for \( [M(\text{Amino acids})(\text{dien})]^{\text{NO}_3} \) complexes

<table>
<thead>
<tr>
<th>( \nu_a )</th>
<th>( \nu_e )</th>
<th>( \nu_s )</th>
<th>( \nu_e )</th>
</tr>
</thead>
<tbody>
<tr>
<td>495 ( \mu )</td>
<td>(102)</td>
<td>356 ( \mu )</td>
<td>(122)</td>
</tr>
<tr>
<td>480 ( \mu )</td>
<td>(100)</td>
<td>352 ( \mu )</td>
<td>(81.8)</td>
</tr>
<tr>
<td>465 ( \mu )</td>
<td>(195)</td>
<td>332 ( \mu )</td>
<td>(67)</td>
</tr>
<tr>
<td>550 ( \mu )</td>
<td>(90)</td>
<td>355 ( \mu )</td>
<td>(100)</td>
</tr>
</tbody>
</table>

* Spectra reported in ref. 4.

To that of cobalt(III) complex. The product, a violet coloured oil, on scrubbing with acetone gave a violet solid which was dried under vacuum in a drying pistol at 56°C (yield 0.4 g).

Found C 33.70, H 6.85, N 19.48, Ni 16.48

[Ni(dien)(Leu)]\( \text{NO}_3 \) requires C 33.88, H 7.05, N 19.75, Ni 16.56%.

In the ir spectra of the parent amino acids the \(-\text{COO}^\text{+}\) group absorbs at 1710 \( \text{cm}^{-1} \) whereas in the cobalt(III) complex C-O stretching band is at about 1630 \( \text{cm}^{-1} \) and at 1650 \( \text{cm}^{-1} \) in the nickel(II) complex, which indicates the presence of coordinated \(-\text{COO}^\text{+}\) group.

Molar conductance of aqueous solution indicates two ions for the nickel(II) complex (125 ohms^{-1} cm^{2} mole^{-1}) and three ions for the cobalt(II) complex (260 ohms^{-1} cm^{2} mole^{-1}). The complex [Co(dien)Cl]_{2} is known to readily aquate to form [Co(dien) (OH)]^{2+} and therefore, taking into account the aquation process, the molar conductance value is reasonably consistent with the proposed structure. Magnetic susceptibility measurements show that the complexes are diamagnetic. This is consistent for \( d^{8} \) Co(III) low spin complex and indicates a square planar structure for Ni(II) complex (Table I).

The visible spectra observed for the Co(III) complex above is similar to the reported mixed ligand complexes of Co(II) involving amino acid and diethylenetriamine.

Author is indebted to Dr. D. M. S. Amatya, Professor and Chairman, Chemistry Department, Tribhuvan University, for various help.

August 4, 1980.


MAGNETIC ORIENTATION IN TERMITE MOUNDS

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Description of the termite mounds as a hydrologic indicator in the ancient Sanskrit work, *Brihat Samhita*, reveals that the termite mounds exhibit preferred direction of physical orientation (Prasad6). The famous, gigantic termite (*Amatermes meridionalis* Froggatt) mounds, called 'magnetic mounds' or 'meridional mounds' in the Northern Territory of Australia exhibit an obvious lateral compression which invariably gives them north-south orientation; the mounds built by certain other termite species (*Amatermes laevis* Mjoberg and *A. vitiosus* Hill) in tropical Australia also exhibit similar north-south orientation of their structure (Gay and Calaby4). The termite mounds in South Africa have also been reported to exhibit preferred orientation (Marais3). The termite 'queen' invariably lies parallel to magnetic north-south direction in its cell in the interior of a live mound (Deoras3). Preferred orientation of termite structure has been experimentally investigated and proved by Becker2.

The objective of this note is to examine magnetic orientation in the termite mounds. For this purpose the termite mounds, occurring on the ground underlain by quartz-magnetite rocks around the Konijedu hills (Survey of India toposheet No. 66 A/3) near Ongole in the Prakasam District of Andhra Pradesh, were selected.