

**Determination Of CO<sub>2</sub> and SCN<sup>-</sup> Binding Capacities of [5,12-dioxa-7,14,dimethyl-1,4,8,11-tetraazacyclotetradeca-1,8 diene(L)] Co(II) Complex**

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Cobalt(II) complex of [5,12-dioxa-7,14,dimethyl-1,4,8,11-tetraazacyclotetradeca-1,8-diene(L)] was synthesised using a template synthesis and characterised using UV-visible spectroscopy, cyclic voltammetry (CV) and FT-IR techniques. CO<sub>2</sub> trapping capacity was studied with a Vernier CO<sub>2</sub> gas sensor capable of measuring the transmitted amount of CO<sub>2</sub>. The solid Co(II) complex shows more CO<sub>2</sub> absorption than that of solid starting material, CoCl<sub>2</sub>.

In UV-visible spectroscopic analysis, the intensity of the orange colour in an aqueous solution of the complex increases with the addition of 0.1 M potassium thiocyanate solution to the metal complex. The intensity of the d-d band at 500 nm decreases while the intensity of CT band around 210 nm increases. This occurs through an isobestic point at 260 nm indicating a SCN<sup>-</sup> association to the complex and FT-IR data confirm the presence of the desired complex.

Cyclic voltammetric studies of the Co(II) complex shows a reversible band corresponding to the Co(II)/Co(I) redox couple. When the DMSO solution of the complex is saturated with CO<sub>2</sub>, the current intensity of the oxidation peak disappears and that of the reduction peak slightly increases. The reappearance of the original reversible redox band after passing N<sub>2</sub> may be indicative of its affinity towards CO<sub>2</sub>. Reduced Co(I) centre of the complex may coordinate with CO<sub>2</sub>, and the coordinated complex may not be easily oxidised back to the original compound.