

ABSTRACT

Functionalised Macrocycles: The Synthesis, Characterization and
Molecular Transport by a Ruthenium Amphiphile.

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Complexation of the two novel ligands: 19,22-didodecyl-1,4,13,16-tetraoxa-7,10,19,22-tetraaza-cyclotetracos-7-yl]-hexaaza-tricyclo[19.3.1.12,6]hexacos-1(25),2(26),3,5,21,23-hexaene-7,20-dione {DL} and 19,22-dioctadecyl-1,4,13,16-tetraoxa-7,10,19,22-tetraaza-cyclotetracos-7-yl]-hexaaza-tricyclo[19.3.1.12,6]hexacos-1(25),2(26),3,5,21,23-hexaene-7,20-dione {OL} with $\text{cis}[\text{Ru}(\text{II})(\text{bipy})_2\text{Cl}_2]\cdot\text{H}_2\text{O}$ resulted in the production of two neutral compounds $(\text{bipy})_2\text{-Ru}(\text{II})\text{-DL}\cdot\text{Cl}_2$ and $(\text{bipy})_2\text{-Ru}(\text{II})\text{-OL}\cdot\text{Cl}_2$.

The critical micelle concentrations (CMC) of both compounds were determined using surface tension measurements. Binding studies were performed on $(\text{bipy})_2\text{-Ru}(\text{II})\text{-DL}\cdot\text{Cl}_2$ using selected group I and Group II metal chloride solutions. Results from the isothermal calorimetric studies (ITC) showed relatively weak interactions with calcium ions, but no conclusive binding interactions could be determined. Electrochemical studies showed anodic shifts for all group I and group II metals tested, however the greatest deviation was observed for calcium ions. Ultraviolet visible (UV-Vis) binding studies

showed no apparent shifts in absorbance, although barium ions showed slight decreases in absorbance at a relatively high molar ratio. Transport studies, using a simple U-tube experiment, showed relatively high transport selectivity towards calcium ions.

Keywords: Varma H. Rambaran; (bipy)₂-Ru (II)-DL. Cl₂; (bipy)₂-Ru (II)-OL. Cl₂; CMC; ITC; UV-Vis; barium ions; calcium ions.