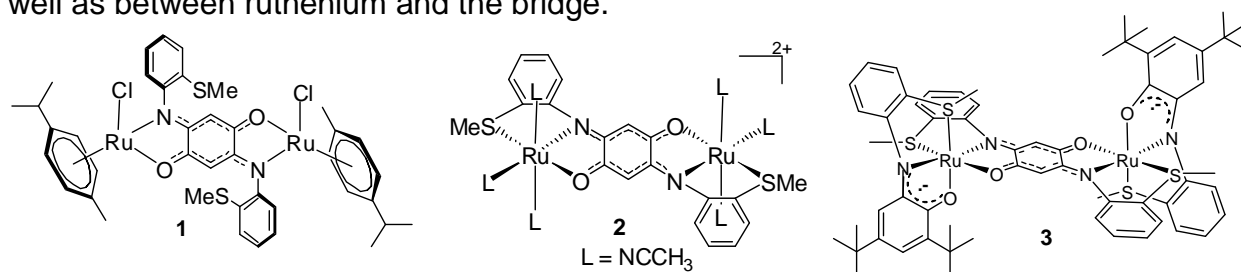


A Super Redox-Rich Diruthenium Complex Displaying Upto Eight Reversible One-Electron Transfer Processes: Spectroscopy at Limits?

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Ruthenium complexes with non-innocent ligands (NILs) such as benzoquinone, iminobenzoquinone, benzoquinonediimine and their redox derivatives exhibit delocalized electron distributions, non-integer oxidation states and interesting electronic properties due to the extensive mixing of NIL π^* orbitals with the ruthenium $d\pi$ orbitals.^[1] The electron distribution within these complexes can be modulated by altering both the ancillary ligands and the NIL, and in a few cases the resultant electron distributions are used to greatest advantage for catalysis like alcohol oxidation, water oxidation etc. The Tanaka catalyst is an interesting example of a Ru–NIL framework in catalysis.^[2] The complex 3 was synthesized from complex 2. 2 in turn was synthesized from 1 by a reaction that results in an unprecedented release of p-cymene which is indeed by SMe coordination to the Ru centre. The complex 3 containing three NILs is also an interesting example of a Ru–NIL framework and shows eight redox process and can be used as an electron-reservoir. The two NILs (terminal) are present in the one electron reduced form ($\text{NIL}^{\cdot-}$) and this leads to a paramagnetic triplet ground state. Electrochemical, UV/Vis/NIR, EPR spectroelectrochemical and SQUID magnetometry investigations were carried out on this complex in order to determine the site of electron transfer in this complex, (anti)ferromagnetic coupling between the two $\text{NIL}^{\cdot-}$ centers as well as between ruthenium and the bridge.



Reference:-

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