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Mixed-Valence Properties in L-type Complexes

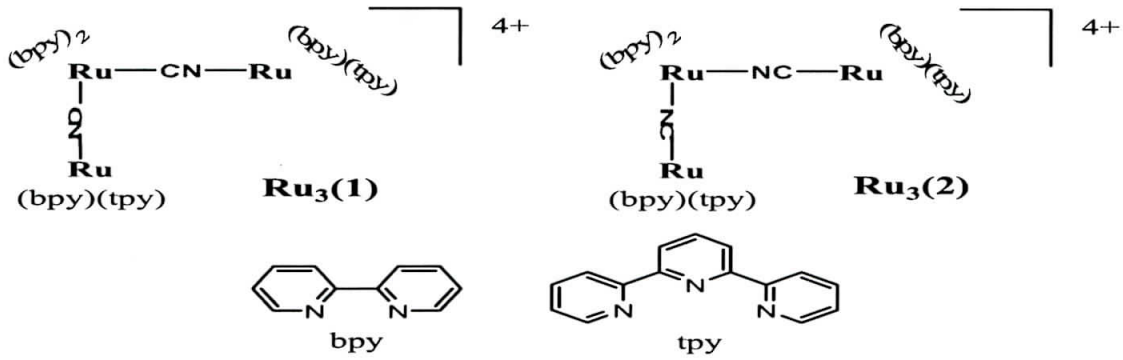
Ju-Ling Lin(林如玲) and Yuan Jang Chen *(陳元璋)

Department of Chemistry, Fu Jen Catholic University, Taiwan, Republic of China
Correspondence e-mail address: 054971@mail.fju.edu.tw

Abstract

Mixed-Valence chemistry in ruthenium is the transition metal choice to study electron transfer or exchange because low spin d^5-d^6 centers form relatively stable coordinate complexes.[1-3] Hush published the well-known basis of mixed-valence chemistry which focused on the two-state model.[4] Creutz, Newton and Sutin reported a new aspect of the superexchange coupling model with the three-state system.[5,6] Few reports provided significant points of real systems for superexchange coupling.[7-9]

The focus of this report is the synthesis and study of L-type tri-ruthenium complexes that exhibit interesting intervalence absorption and strong comproportionation between terminal metal centers. The electrochemistry of $\Delta E_{1/2}$ between terminal centers for $Ru_3(1)$ and $Ru_3(2)$ ranged between 0.12 and 0.13 V.



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