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Investigations of transition metal complexes with fluorescence or metal to metal charge transfer properties

Metal-organic framework materials with fluorescent, white light or gas-adsorption properties, and transition metal clusters with metal to metal charge transfer properties have become of much interest in fundamental research and modern material science. Recently, the following investigations have been made in my research group: (1) A series of neutral MOFs encapsulated various neutral and ionic guest dye molecules have been designed and synthesized, their luminescent properties have been investigated. The white light-emitting MOF materials could be designed and prepared when three red/green/blue-emitting dyes were introduced simultaneously into such MOF host. Interestingly, the white light is tunable by changing the content or type of the three dye guests, or the excitation wavelength. (2) A series of new luminescent zinc or lanthanide phosphonates and their luminescent properties have been investigated. Furthermore, some lanthanide phosphonates exhibit the remarkable capability to rapidly detect trace amounts of nitroaromatic explosives through luminescent quenching. The sensitivity, fast response, facile synthesis, low usage, cheapness, and good stability make it one of the most powerful nitroaromatic explosives sensors known. (3) A series of mixed valent cyanidometal bridged compounds have been designed, synthesized and characterized, their metal to metal charge transfer properties and the influence factors of electron transfer process have been investigated. In particular, an unusually delocalized mixed-valence state of a cyanidometal bridged compound induced by thermal electron transfer have been reported for the first time.

Biography

Xin-Tao Wu graduated from Xiamen University in 1960 and completed his Master Degree in Science from Fuzhou University in 1966. He is Professor of Chemistry, Director of the Academic Committee from 2000 to 2013, Fujian Institute of Research on the Structure of Matter, Chinese academy of Sciences, and has been a Member of the Chinese Academy of Sciences from 1999. He has published more than 300 papers in reputed international chemical journals.

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