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Chemicals & Chemistry

Researchers from National Institute for Interdisciplinary Science and Technology Report on Findings in Chemistry and Materials Research

2013 AUG 23 (VerticalNews) -- By a News Reporter-Staff News Editor at Chemicals & Chemistry -- Current study results on Chemistry and Materials Research have been published. According to news reporting originating from Trivandrum, India, by VerticalNews correspondents, research stated, "This investigation demonstrates the heavy atom effect (HAE) concept in developing new organic phosphors and engineering the excited-state energy levels in lanthanide metal ion suprastructures. This was accomplished by coupling two independent energy-transfer photophysical processes: enhancing the electronic population in the excited triplet state through intersystem crossing (ISC) and transferring the triplet energy to the excited state of the lanthanide ions."

Our news editors obtained a quote from the research from National Institute for Interdisciplinary Science and Technology, "A new series of iodo-substituted carboxylic ligands were synthesised through a tailor-made approach and complexes with Eu3+ ions to give one- and three-dimensional metal-organic frameworks (MOFs). Single-crystal structures of the europium complexes revealed the formation of a 1D linear coordination polymer for the monocarboxylate ligand and 3D MOFs for the dicarboxylate ligand. The HAE quenches the S1S0 transition (self-fluorescence) in these ligands and promotes S1T processes for building enhanced excited triplet electronic states. Single-crystal structures of iodo-substituted complexes proved that the ligand molecules were held together by strong stacking. The stack restricted vibration relaxation and, as a result, these ligands turned into white or yellowish solid-state organic phosphors. In Eu3+ ion complexes, the solid-state phosphorescence of the ligands was completely quenched and the triplet excitation energy was channelled into ligand-to-metal energy transfer."

According to the news editors, the research concluded: "Thus, the current approach opens up a new strategy for designing luminescent MOFs based on the HAE principle by controlling the excited-state energy levels."

For more information on this research see: Heavy Atom Effect Driven Organic Phosphors and Their Luminescent Lanthanide Metal-Organic Frameworks. *Chempluschem*, 2013;78(7):737-745. *Chempluschem* can be contacted at: Wiley-V C H Verlag Gmbh, Boschstrasse 12, D-69469 Weinheim, Germany. (Wiley-Blackwell - www.wiley.com/; Chempluschem - onlinelibrary.wiley.com/journal/10.1002/(ISSN)2192-6506)

The news editors report that additional information may be obtained by contacting A. Balamurugan, Natl Inst Interdisciplinary Sci & Technol NIIST, Chem Sci & Technol Div, Trivandrum 695019, Kerala, India.

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