MSE-Colloquium@NTU

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Pressure-Induced Emission Enhancement

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Abstract

The fluorescence of most luminescent materials exhibits a pressure-caused quenching. However, a few luminescent materials experience a pressure-induced emission enhancement (PIEE). Our group has revealed 4 mechanisms of PIEE. The first is based on aggregation-induced emission materials. Pressure will restrict intramolecular rotation or vibration, thus decreasing non-radiative transition, resulting in the PIEE of luminescent materials. The second is based on pressure-strengthened exciton binding energy, leading to PIEE. The third is pressure-modulated transition channels, causing PIEE of defects in materials. The fourth is the regulation of interactions between ligands and nanomaterials, which cause the PIEE of a series of nanomaterials. These results will enrich the research directions of high-pressure chemistry and show potential applications in the fields of pressure switches and pressure sensors.

Biography

Dr Zou Bo studied chemistry at Jilin University from 1992 – 2002. As a joint postgraduate student and a postdoctoral fellow, he studied in the University of Münster and Dortmund University from 2001 – 2005. In January 2006, he became a Professor at the State Key Laboratory of Superhard Materials at Jilin University. His research interests include high-pressure chemistry. Professor Zou is a Chang Jiang Scholar (MOE) and National Distinguished Young Scholar (NSFC). He has published more than 270 papers in journals, including Nature Communications, Journal of the American Chemical Society and Angewandte Chemie International Edition.

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