

MULTI-STIMULI RESPONSIVE CHROMIC CYCLOMETALATED Pt(II) COMPLEXES

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Interest in chromic materials is rapidly increasing for their applications as smart responsive materials. The majority of the reported materials respond to one stimulus and few show multi-stimuli response. In this field, square-planar platinum(II) complexes have emerged as archetypal systems to understand the fundamentals of molecular self-assembly and related phenomena, including crystallization/polymorphism and aggregation-induced emission. Their rigid skeleton favor the formation of supramolecular structures through Pt \cdots Pt and/or $\pi\cdots\pi$ interactions and lead to unique photophysical properties, such as long-lived 3 MMLCT emission arising from metal–metal interaction of relevance in electronic devices, chemosensors or bioimaging¹. Particularly, cycloplatinated compounds containing strong field ligands are attractive platforms for self-assembled strongly emissive functional materials whose photophysical characteristics can be modulated by controlling their assembly, which constitutes a powerful tool for developing materials with stimuli-responsive luminescence properties.

In this context, one of our research projects concerns the self-assembly and photophysical properties of cyclometalated Pt(II) compounds with chloride/isocyanide, alkynyl/isocyanide and picolinate ligands of the form [Pt(C \wedge N)Cl(CNR)], [Pt(C \wedge N)(C \equiv CR')(CNR)] and [Pt(C \wedge N)(R-pic- κ -N,O)]. We demonstrate the fine modulation of molecular packing and emission properties by minor molecular structural variations or solvents using X-ray diffraction and theoretical studies²⁻⁴. They form aggregates through Pt \cdots Pt and/or $\pi\cdots\pi$ interactions in the ground and excited states, giving rise to different chromic behavior upon application of one or several stimuli.

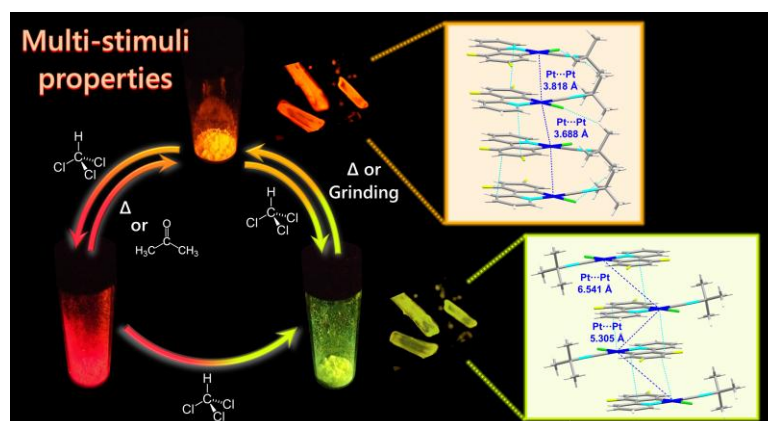


Figure: Multis-stimuli responsive properties and crystal packing of one of the complexes studied

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