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# 晶格材料的构建及在辐射剂量探测中的应用

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## Summary

Radiation dosimeters displaying conspicuous response of irradiance are highly desirable over the recent decade, owing to the growing demand of monitoring high-energy radiation and environmental exposure. Herein, we present a case of dosimetry based on a discrete nanocluster, Th-SINAP-100, by judiciously incorporating heavy Th6 polynuclear centers as radiation attenuator and organic linkers as photo-responsive sensor. Interestingly, dual-module photochromic and fluorochromic transitions upon multiple external stimuli including UV, β-ray, and γ-ray are integrated into this single material. The striking color change, and more significantly, the visible color transition of luminescence in response to accumulating radiation dose allow an on-site quantitative platform for naked-eye detection of ionization radiations over a broad range (1–80 kGy). Single crystal X-ray diffraction and density functional theory calculations reveal that the photochromic and fluorochromic can be attributed to the π(TPC)⟶π*(TPC) intermolecular charge transfer driven by enhanced π-π stacking interaction between the adjacent TPC moieties upon irradiations.

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