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Fluorescent Metal Organic Frameworks for the visual enhancement of latent fingerprints

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Highlights

- MOF's can be used to enhance the visibility of latent fingerprints that have been treated with cyanoacrylate
- Different substrates that carry fingerprints can be treated with the MOF precursors for this development
- The MOF treatment shows great promise as an alternative for Gentian Violet treatment of tapes.

Dedicated to the loving memory of Antonio (Tony) A. Cantu, who passed away on June 29 2018.

Abstract

Lanthanide-based (Eu and Tb) metal organic frameworks (MOFs) synthesized in this work are highly fluorescent crystalline structures that form through a self-assembly process in an aqueous environment. Various bio-organic molecules, including proteins and amino acids, can act as inducing agents for this process. The fact that these components are present in fingerprint secretions, in combination with the excellent luminescent properties of the MOFs, create a visualisation method for (latent) fingerprints. The aqueous MOF precursor solutions are not ideal for the visualisation of latent fingerprints on non-porous surfaces, such as aluminium foil and glass. However, they offer a simple, non-toxic, long-lasting and effective approach for the visibility enhancement of fingerprints treated with cyanoacrylate fuming on aluminium foil and glass and latent fingerprints on the adhesive side of a transparent tape. The luminescent properties of MOF-treated fingerprints persevered for at least 12 months, providing great alternative for commonly used organic dyes such as Basic Yellow 40 and Gentian Violet. In this

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