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Vapochromic Behavior of MOF for Selective Sensing of Ethanol

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KEYWORDS: Vapochromic; MOF; Ethanol; coordination geometry.

ABSTRACT

A MOF material, $Co_3[Co(CN)_6]_2$ nanoparticles has been prepared for the effective detection of ethanol in vapor phase. When exposed to ethanol vapor, the material was changed from pink to purple, which is easily observed by naked eyes directly. We propose that the ethanol response is due to ethanol molecules entering the pores of the solid, where they alter the coordination geometry, leading to conversion of their Co centers from octahedral to tetrahedral coordination. Significantly, the change is reversible, which make the material resuable without subjecting to dynamic vacuum or slightly warming.