

## عنوان مقاله:

An amine/imine functionalized microporous MOF as a new fluorescent probe exhibiting selective sensing of Fe<sup>3+</sup> and Al<sup>3+</sup> over mixed metal ions

## محل انتشار:

فصلنامه ارتباطات شیمی ایران، دوره 8، شماره 2 (سال: 1399)

تعداد صفحات اصل مقاله: 17

## نویسندگان:

Vahid Safarifard - *Department of Chemistry, Iran University of Science and Technology, Tehran ۱۶۸۴۶-۱۳۱۱۴, Iran*

Yeganeh davoudabadi farahani - *Department of Chemistry, Iran University of Science and Technology, Tehran ۱۶۸۴۶-۱۳۱۱۴, Iran*

## خلاصه مقاله:

Nowadays metal-organic frameworks with multiple luminescent centers are very fascinating as multifunctional luminescent material because of their luminescence properties, which could be systematically tuned by deliberate use of organic ligands and metal ions. In this research, we explored a microporous mixed-ligand MOF for highly selective and sensitive detection of metal ions. A two-fold interpenetration pillared-layer amine/imine-functionalized MOF known as TMU-16-NH<sub>2</sub>, [Zn<sub>2</sub>(NH<sub>2</sub>-BDC)<sub>2</sub>(4-bpdh)]·3DMF, have been synthesized via a mixed ligand approach using amino-1,4-benzenedicarboxylate (NH<sub>2</sub>-BDC) and 2,5-bis(4-pyridyl)-3,4-diaza-2,4-hexadiene (4-bpdh) under solvothermal condition. Sensor TMU-16-NH<sub>2</sub> exhibits Al<sup>3+</sup>-selective TURN-ON and Fe<sup>3+</sup>-selective TURN-OFF type fluorescence emission responses, for which the electrostatic interaction between Fe<sup>3+</sup> and Al<sup>3+</sup> ions and the inner surface of the micropores may play a critical role. Moreover, the sensor TMU-16-NH<sub>2</sub> shows significantly color change from light yellow to orange and colorless with the addition of Fe<sup>3+</sup> and Al<sup>3+</sup> ions, respectively, which is distinguished by naked-eye. More significantly, the remarkable quenching and enhancing effects of TMU-16-NH<sub>2</sub> for Fe<sup>3+</sup> and Al<sup>3+</sup> possess the advantages of good selectivity, fast response time (<1min), low-cost, as well as very low detection limits of 0.7 and 0.09 μM for Fe<sup>3+</sup> and Al<sup>3+</sup>, respectively. Interestingly, the probe exhibits high sensitivity for Fe<sup>3+</sup> and Al<sup>3+</sup> ions, which is far below WHO's acceptable limit in drinking water.

## کلمات کلیدی:

+Metal-organic frameworks, fluorescence, sensing, Fe<sup>3+</sup>, Al<sup>3+</sup>

## لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1035052>

