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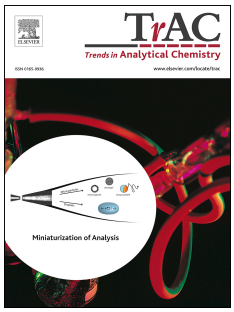

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Nanomaterial-based optical chemical sensors for the detection of heavy metals in water: Recent advances and challenges

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Abstract

The anthropogenic release of heavy metals into the natural water has become a global epidemic. Heavy metal contamination poses serious threats to human health and the environment. Therefore, the development of sensors for monitoring of these toxic metals in different matrices, especially in water, is very important. As a powerful analytical tool, nanomaterial-based chemical sensors have been extensively employed for the detection of heavy metals. These nanosensors offer several advantages including high sensitivity, selectivity, portability, on-site detection ability and improved performance of devices. Moreover, the deployment of molecular recognition probe on the nanostructures for the selective binding have enhanced the selectivity and detection ability.

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