



A novel luminescent EuBTC@HA composite with dual sensing properties

Autorzy

Weronika Bodylska

Adam W. Augustyniak

Dariusz C. Bieńko

Marzena Fandzloch

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Streszczenie

This study aims to present a new composite material based on the EuBTC@HA system (where H₃BTC = 1,3,5-benzenetricarboxylic acid and HA stands for hydroxyapatite) for dual sensing of Fe³⁺ ions and ofloxacin. It is the first example of a Eu(III)-based coordination polymer supported on a (bio)carrier. Selective detection of Fe³⁺ ions was possible in a wide concentration range of 1.00 × 10⁻² M down to 7.80 × 10⁻⁵ M, with quenching at a concentration of 7.50 × 10⁻³ M. An analogous study was performed for EuBTC, showing comparable photoluminescence activity. Therefore, the maximum use of the active form of EuBTC with its minimal amount in EuBTC@HA allowed the reduction of metal concentration (31.7 vs. 13.6 wt% Eu) while maintaining activity. In addition, the reusability of EuBTC@HA was determined, showing that it may be used at least five times for the detection of Fe³⁺ ions without a significant change in emission intensity. Furthermore, using EuBTC@HA allows for the detection of Fe³⁺ ions in buffers within the pH range of 4.5–8.8. The additional functionality of EuBTC@HA was confirmed by the ability to detect ofloxacin at a concentration of 3.90 × 10⁻⁵ M with a naked-eye colour change effect. Finally, the fluorescence quenching mechanism for Fe³⁺ ions and ofloxacin was also investigated.

Adres publiczny

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Strona internetowa wydawcy

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