

The detection and removal of Cr(III) ion with the fluorescent dual-Bodipy

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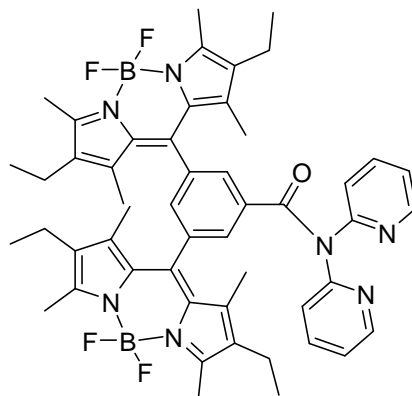
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Chromium (III) ion is important for the metabolism of carbohydrates, proteins, lipids and nucleic acids that its deficiency caused to diabetes, cardiovascular diseases. However, the excessive of chromium (III) ion has some hazardous effects for the environment. Therefore, the detection techniques of chromium have been attractive for the sensor chemists [Eastmond, 2008; Mcrae, 2009]. As fluorescent sensor, Bodipy compounds have been used for the potential optical studies due to their perfect photophysical properties as sharp absorption profile, high fluorescence quantum yields, good photo-stability and large extinction coefficients. In presence of metal ions, the absorption wavelength of Bodipy dyes can shift and an increasing-quenching in the fluorescence intensity can be observed [Bayrakçı, 2013; Kursunlu, 2012].

In this study, a novel fluorescent Cr(III) sensor with dual-Bodipy was prepared, and its complexation reactions were studied with various metal ions [Mn (II), Fe (II), Co (II), Ni (II), Cu (II), Ag (I), Zn (II), Cr (III), Ga (III), Hg (II), Al (III), La (III), Er (III), Yb (III), Tb (III), Eu (III)]. The results show that the sensor can selectively detect to chromium (III) ion. Upon on the addition of chromium (III) ion, the fluorescence intensity was importantly increased. The complex stoichiometry between sensor and Cr(III) was determined from the Job plots using the UV-visible spectra, which showed evident 1:2 (metal:ligand).



References

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