

Study on fluorescence recognition of Fe^{3+} , $\text{Cr}_2\text{O}_7^{2-}$ and p-nitrophenol by a cadmium complex and related mechanism

by Lu Liu et al.

The paper presents a new fluorescent ligand and its ternary complex that gives analytical signals after mixing with $\text{Fe}(3+)$, dichromate ions or p-nitrophenol. More or less selective signal is reached for $\text{Fe}(3+)$ and $\text{Cr}(\text{VI})$. The idea of employment of fluorescent metal complexes is not quite novel but may be productive for the development of sensors for organic and inorganic species. However, this idea has not been properly developed in this manuscript either to achieve an efficient analytical protocol (there is no such protocol) or a profound fundamental study (it is not such a study either, though mechanism study is claimed in the title).

Below are my major concerns about this manuscript.

1. In Figs. 4, 5, and 6 the blank signals (with no analyte) are not shown. They are needed to figure out the intensity of the analytical signal.
2. line 155: little interference is claimed but it contradicts Fig 4b, because the signals with $\text{Fe}(3+)$ differ several-fold. For example, the effects of Mn and Ca. This cannot be deemed "little interference".
3. Another question, are these effects reproducible? Were any replicated measurements taken? No statistical data are given throughout the text.
4. The analytical part of work ends up with the reported LODs. These LODs are very high for a fluorimetric method, although the determination may be selective for Fe and $\text{Cr}(\text{VI})$. It is necessary to discuss which real-world samples can be analyzed with such limits of detection and selectivity.
5. What conclusions can be drawn from Fig. 7?
6. section 3.5: The whole section is written quite messy and the conclusions on the sensing mechanism are not formulated. Actually, the mechanism is not suggested here.
7. line 210: Why such a set of organic compounds was selected for the investigation, solving what kind of task was it targeted? No other nitro-compounds were studied; what is the effect of other nitrogroup-containing compounds that are also supposed to act as quenchers?
8. line 218: "*Cd-O bond lengths were 2.460 and 2.256 Å, which is in accordance with the experimental results.*" – what kind of experimental results are implied here?
9. lines 220-225: cation- π interactions should be substantiated more clearly.

Some minor remarks:

10. line 3 (title): 'complexe' (complex)
11. The same data are presented in Figures 'a' and 'b' of Figs. 4, 5, and 6. Figures 'a' can be safely omitted.
12. Lines 140 and 145, line 181: why are cations and anions arranged in such sequences? Logically, they should have been ordered by atomic weight, or by signal intensity, or starting from alkalis and alkaline earths and then moving on to transition metals. But here they are given without any regularity.
13. line 158: suffered–? (subjected to)
14. line 166, 188: the LODs should be shown with 1, at maximum 2 significant digits ($1.1 \cdot 10^{-3}$ mol/L).

The manuscript contains too many weaknesses to be published. I can only advise rejection and possible resubmission only after adding experimental data and complete rewriting.