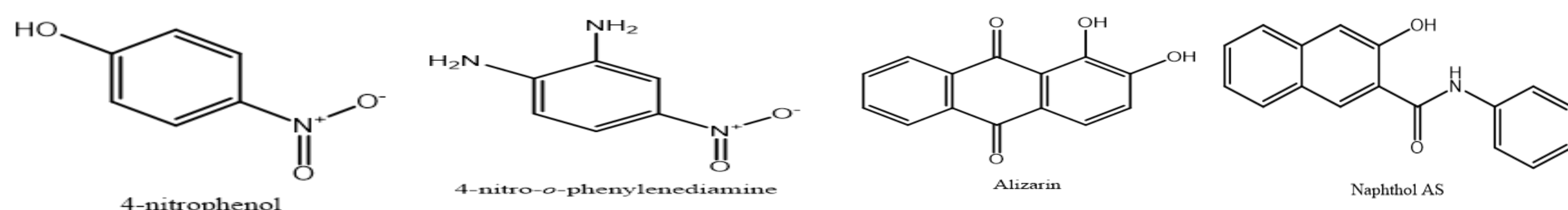


## Abstract

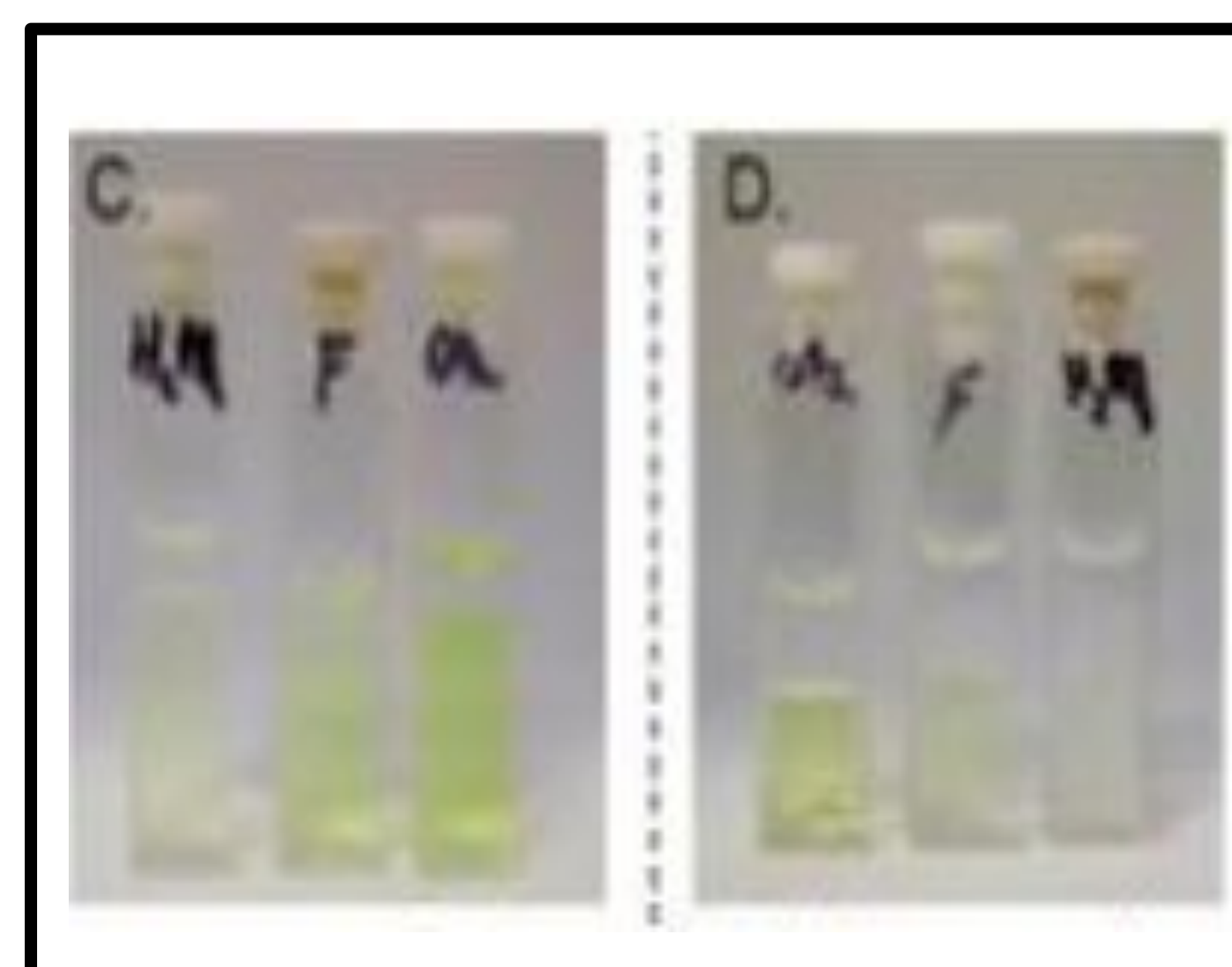
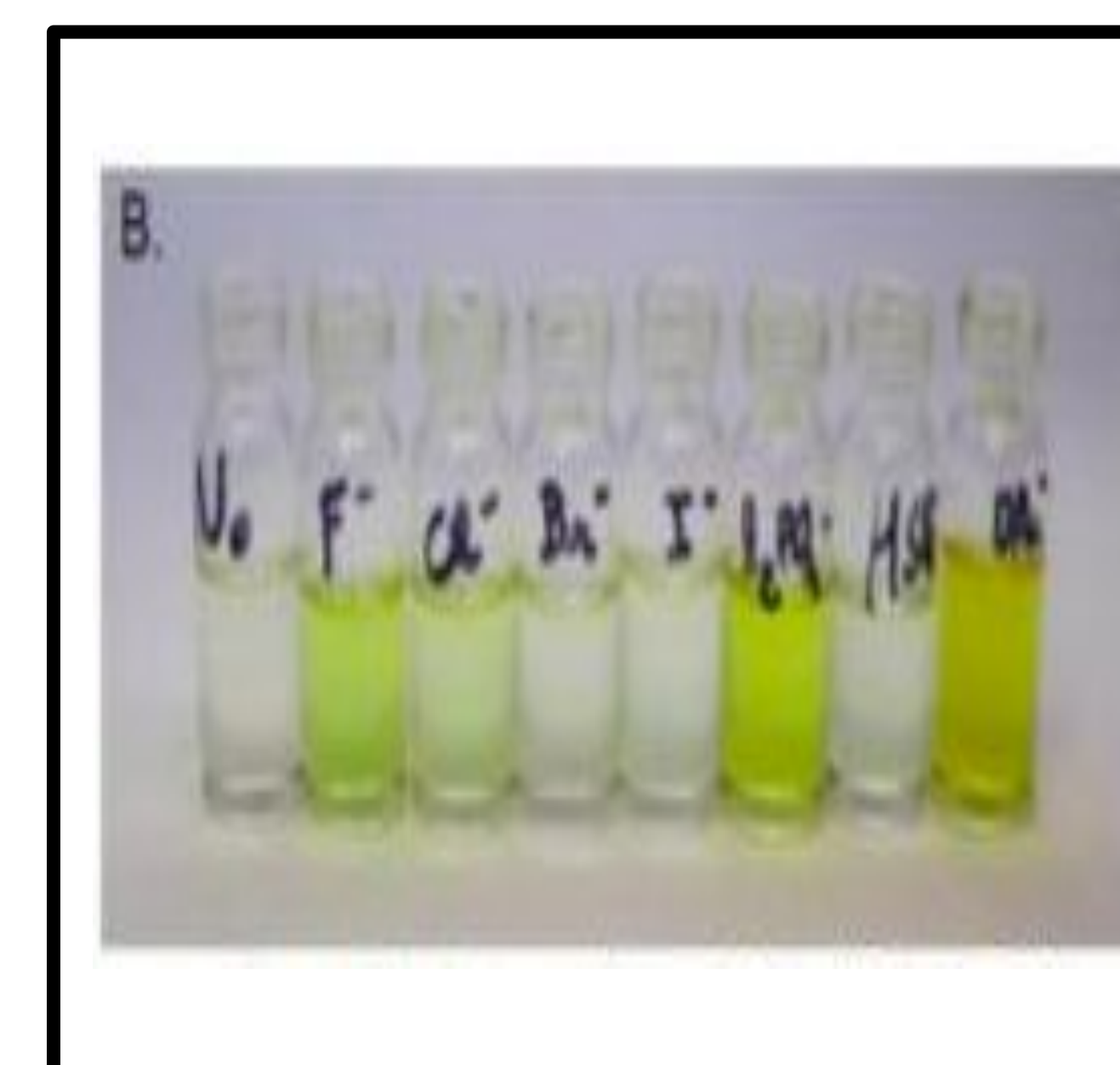
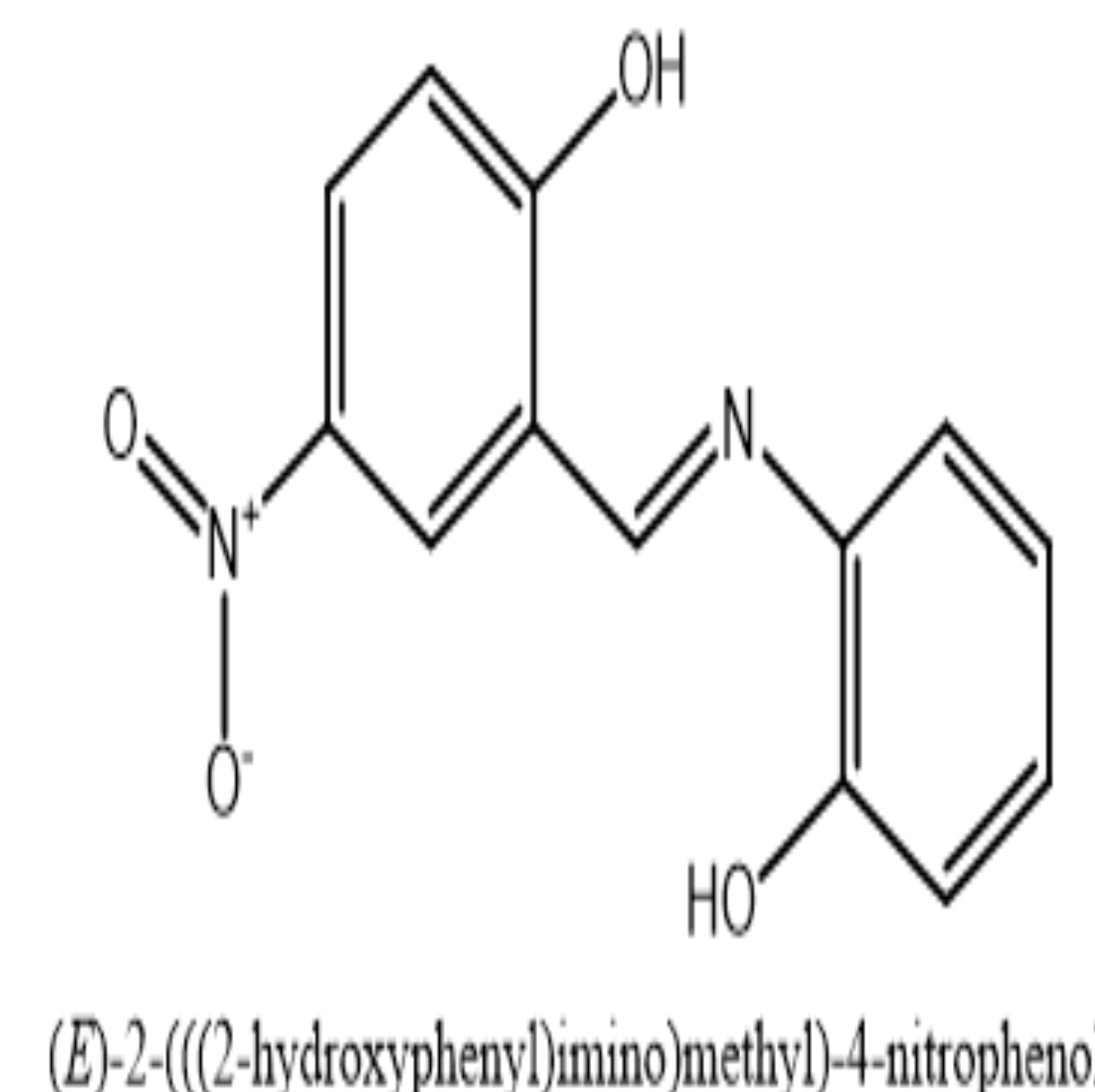
Most chromophores are not selective towards certain anions. Due to this, chemists have been trying to develop different methods to improve the selectivity of optical anion sensors. One of the methods that could be done to improve the selectivity is the usage of an extracting agent. We want to put this into practice by using different combinations of TBA salts and chromophores. By doing liquid-liquid extraction, we can see if selectivity is possible. First, the optimal concentration of each chromophore and TBA salts combination was determined. With the future works plans is the liquid-liquid extraction.

## Chromophores

The chromophores used in the experiments are Alizarin, 4-nitrophenol (4-NP), Naphthol AS, 4-nitro-*o*-phenylenediamine (4-NPA) dissolve in dichloromethane.



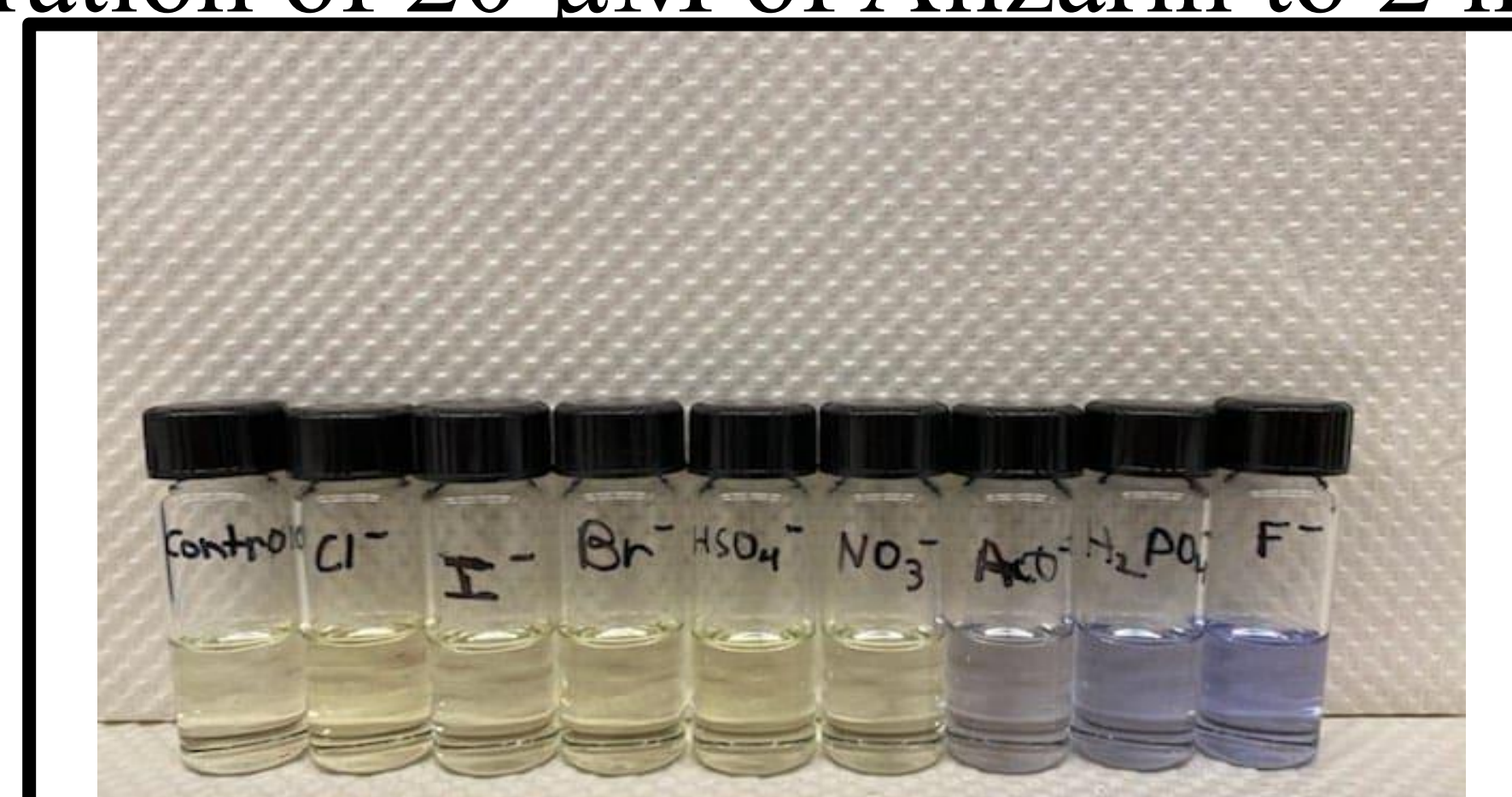
## Liquid-Liquid Extraction



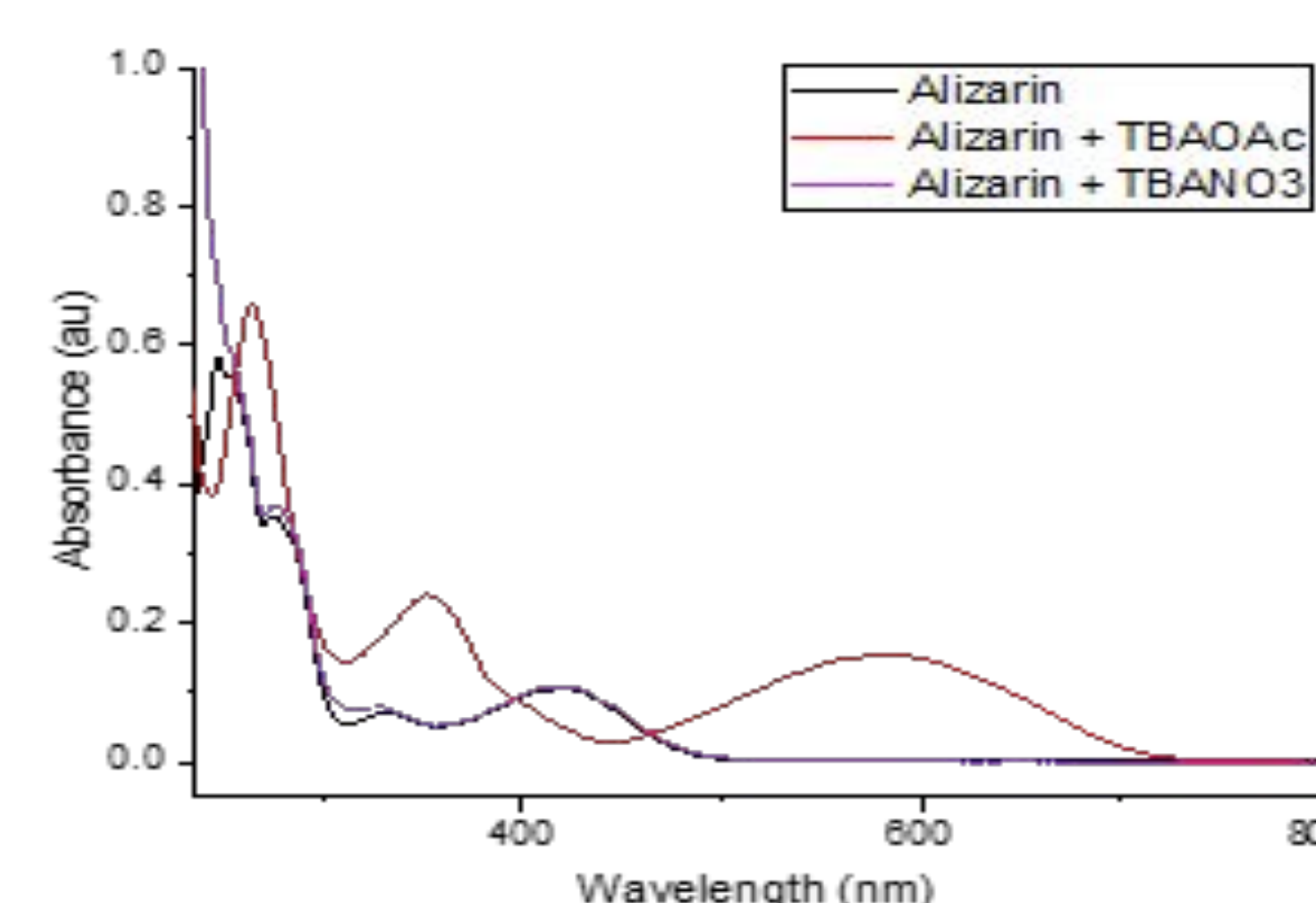
Previous data using a different chromophore is displayed above. This chromophore was sensitive towards acetate, dihydrogen phosphate and fluoride. Using different extracting agents (TBAX), the possibility of selective acetate extraction into the organic layer was tested. Due to the nature of the extracting agent, anion's correlation in regard to the Hofmeister series, the successful acetate extraction would sometimes observed.

## Alizarin with TBA salts

The concentration of 20  $\mu$ M of Alizarin to 2 mM of the TBA salts



The picture shows the chromophore (Alizarin) in the presence of different tetrabutylammonium (TBA) salts. Alizarin is sensitive toward acetate, fluoride, dihydrogen phosphate ions.



The graph shows the difference in UV-Vis spectra between Alizarin and Alizarin the present of acetate and nitrate.

## Conclusion and future work

- The best concentration of the chromophores seemed to be in the range of 20-50  $\mu$ M, With a x100 equivalence for the TBA salts.
- Under these conditions, visible color change and good UV spectra was observed.
- With these parameter, the next step would be liquid-liquid extraction.

## Reference

- (1)Busschaert N. Proposal for National Science Foundation.
- (2)Miyaji H, Sessler JL. Off-the-Shelf Colorimetric Anion Sensors. Angew Chem Int Ed Engl. 2001 Jan 5;40(1):154-157. doi: 10.1002/1521-3773(20010105)40:1<154::AID-ANIE154>3.0.CO;2-G. PMID: 29711963.

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