


 Research centre
for toxic compounds
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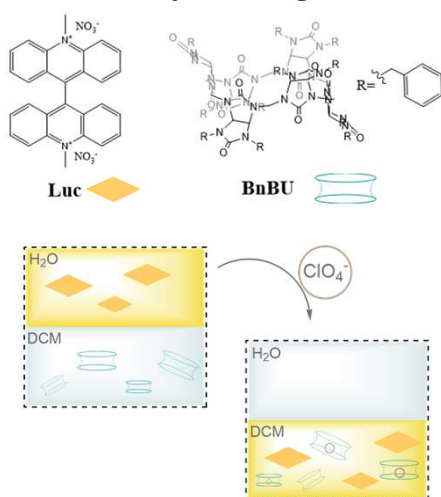
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Introduction

The ingestion of water or food products containing ClO_4^- represents a potential human health risk due to its interference with iodide on its uptake by the thyroid gland.^{1,2} Additionally, the levels of ClO_4^- in drinking water have been increasing due to its wide industrial use. Even though the analysis and detection of trace amounts in water is essential, there is no specific method for a selective analysis of perchlorate. Herein, a highly hydrophobic Bambusuril derivative (**BnBU**) have been used for the *phase-transfer* extraction (PTE) of ClO_4^- from water,³ and an organic dye was introduced as colorimetric indicator, allowing a direct and quantitative detection of anions via UV/Vis spectroscopy.

Project design

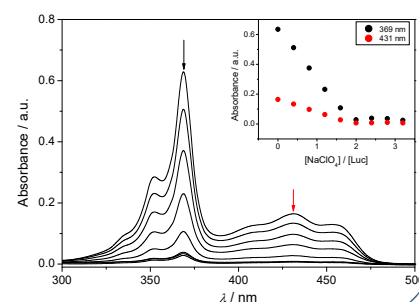
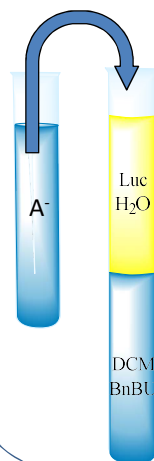


Proposed method

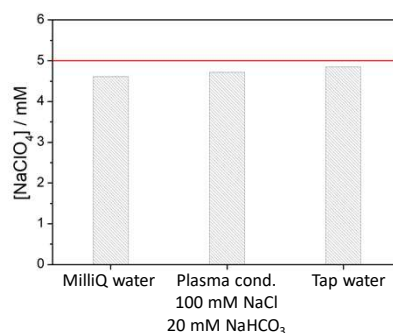
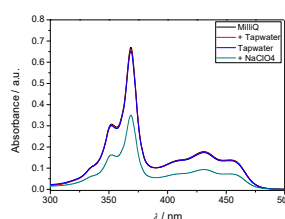
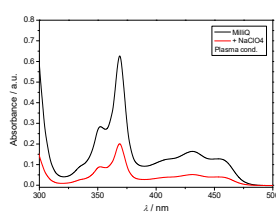
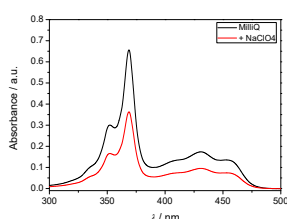
Initial conditions

$$[\text{Luc}]_{\text{H}_2\text{O}} = 20 \mu\text{M}$$

$$\text{BU}_{\text{DCM}} = 2.5 \text{ eq}$$



Results



Conclusions

We propose a new approach for quantification of ClO_4^- in water based on the ability of Bambusuril macrocycles towards the *phase-transfer* extraction of anions into DCM due to their strong binding within the receptor. The methodology showed no response towards common anionic or cationic interfering species and accurate results were obtained for the analysis ClO_4^- in different matrices. The simplicity and accuracy of the results indicate that this method could be further developed and applied on real sample analysis.

References

1. R. Calderón, F. Godoy, M. Escudey and P. Palma, *Environmental Monitoring and Assessment*, 2017, **189**, 82
2. M. L. Magnuson, E. T. Urbansky and C. A. Kelty, *Anal. Chem.*, 2000, **72**, 25-29
3. C. M. Starks, *J. Am. Chem. Soc.*, 1971, **93**, 195-199

Acknowledgement

This work was supported by the Czech Science Foundation (18-21801S) and by the RECETOX Research Infrastructure (LM2015051 and CZ.02.1.01/0.0/0.0/16_013/0001761)