STUDY OF THE INTERACTION OF METAL CATIONS WITH FUCOIDAN

Teresa Mêna Oliveira, Cosme Moura, António F. Silva
Centro de Investigação em Química da Universidade do Porto (CIQUP), Rua do Campo Alegre, 4169-007 Porto, Portugal

CONTEXTUALIZATION

- Fucoidan (Fig. 1, 3) is a sulfate polysaccharide mainly found in the cell-wall matrix of various species of brown algae (Phaeophyceae) and contains substantial percentages of L-fucose and sulfate ester groups [1-2].
- Brown algae are recognized by their biosorption performance and capacity to bind cations, being Fucoidan one of the main intervenient in the metal chelation process [1].
- Quantification of lead(I) – Fucoidan interaction is fundamental to the evaluation of Fucus vesiculosus (Fig. 2) potential in the context of wastewater remediation.
- The objective of this work is the evaluation of the Pb²⁺ - Fucoidan interaction by potentiometric studies.

POTENTIOMETRIC STUDIES

SOLUTION

Potentiometric titration of Fucoidan with 0.1 mol.dm⁻³ NaOH standard solution

- Quantification of Fucoidan's total acidic groups
- Surface charge determination

SUSPENSION

Potentiometric titration of Fucoidan with a 0.06 M Pb²⁺ standard solution

- Berg-Ruzic Method
- Freundlich Isotherm

CONCLUSIONS

- Total acidic groups of Fucoidan was quantified as 0.92 mmol.g⁻¹.
- The interaction Pb²⁺ - Fucoidan stoichiometry was defined as 1:1.
- Fucoidan-Pb²⁺ formation constant in aqueous solution (pH = 6) is 4.1x10⁴ dm³.mol⁻¹ at 25 ± 2 °C.
- The obtained value for Fucoidan-Pb²⁺ Freundlich coefficient is 5.3x10⁻² at 25 ± 2 °C.

REFERENCES


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