Adsorption of copper ions on *Thymus serpyllum* L. plant for the production of nanocrystalline compound

Mária Kováčová [1, 2], Halyna Yankovych [1, 2], Mariano Casas Luna [3], Michaela Remešová [3], Ladislav Čelko [3], Matej Baláž [1]

[1] *Institute of Geotechnics, Slovak Academy of Sciences, Watsonova 45, 040 01 Košice, Slovakia,* ***kovacovam@saske.sk***

[2] *Faculty of Materials, Metallurgy and Recycling, Technical University of Košice, Letná 9, 042 01 Košice, Slovakia*

[3] *Central European Institute of Technology, Brno University of Technology, Purkyňova 656/123, 612 00 Brno, Czech Republic*

➢ Introduction

In recent years, research on the mechanisms of biosorption has extended as it is an effective and inexpensive opportunity for the removal of heavy metal ions from the aqueous solutions [1]. Biosorption, as a form of a passive remediation treatment, is mainly based on the affinity between a biosorbent and an adsorbate [2].

The main focus of this study was to determine the best parameters for the adsorption of copper (as one of the heavy metals) on *Thymus serpyllum* L. plant in a batch mode. The effects of contact time, pH and adsorbent dosage were examined. The residual Cu(II) concentration in filtrates after adsorption was analysed by atomic absorption spectrometry.

➢ Materials & Methods

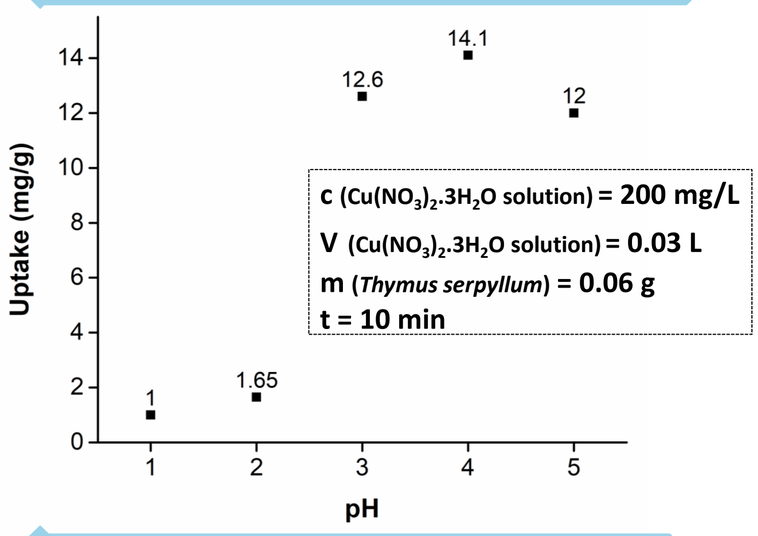
$Cu(NO_3)_2.3H_2O$ solution
c = 200 mg/L

***Thymus serpyllum* L.**
(powdered with
a particle size ≤ 1 mm)

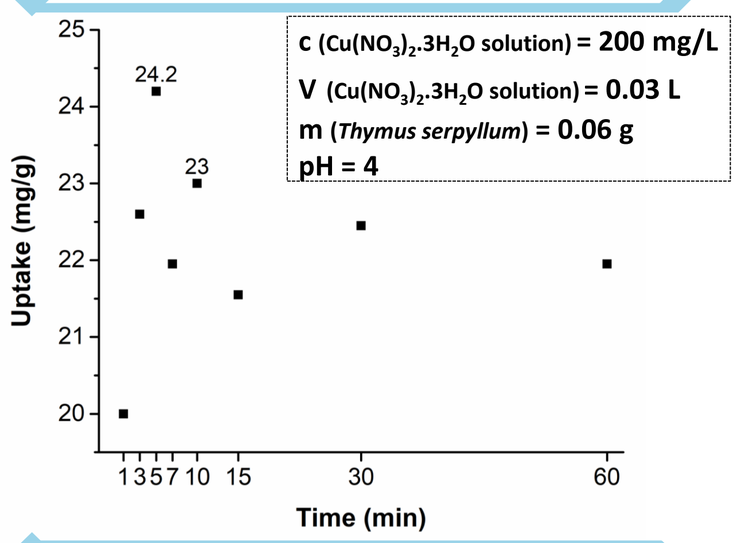
Adsorption performed in Erlenmeyer flasks on a laboratory shaker at laboratory temperature

➢ Results

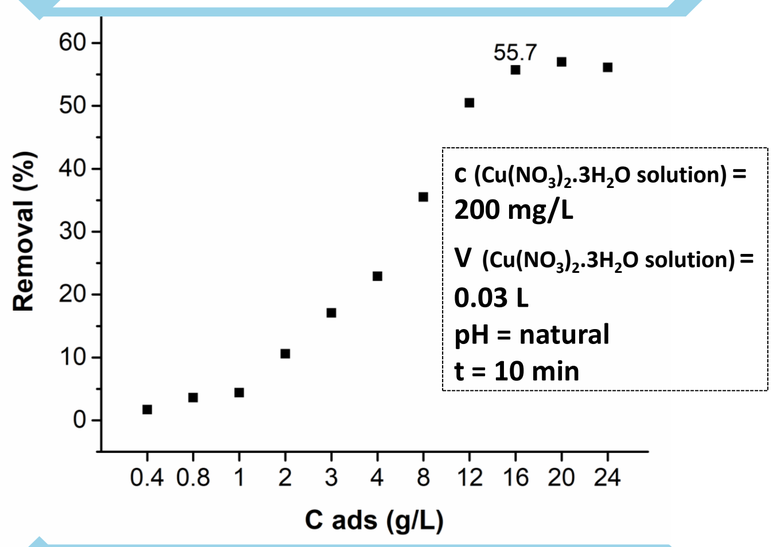
Effect of pH



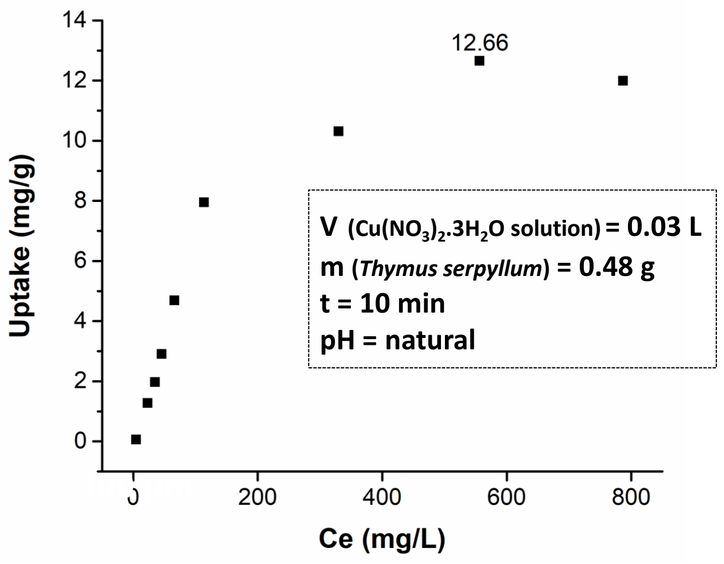
Effect of contact time



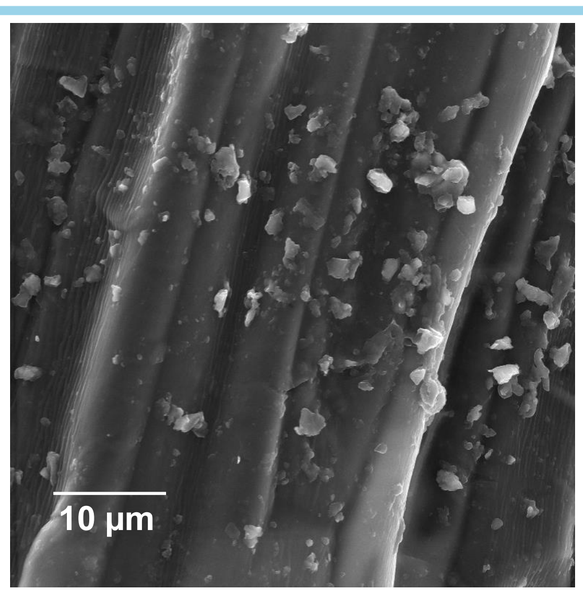
Effect of adsorbent dosage



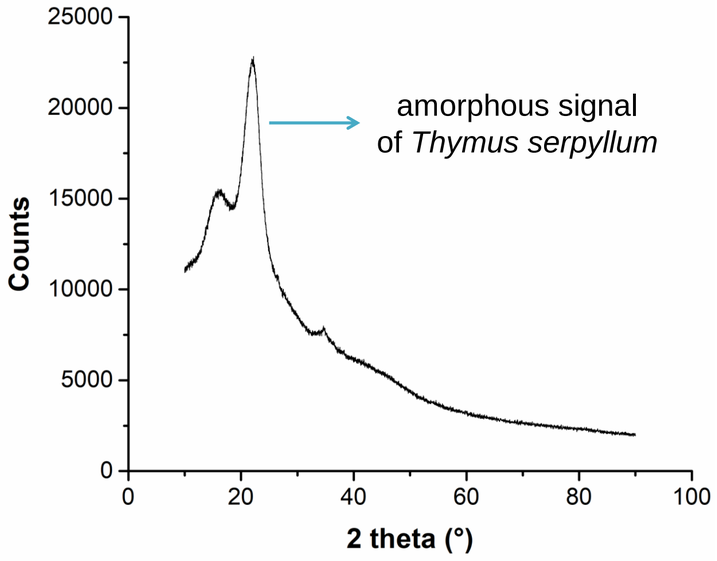
Isotherm of Cu(II) removal



SEM



XRD



➢ Conclusion

- ***Thymus serpyllum L. plant*** was proposed as a new potential biosorbent and the best parameters for the adsorption of Cu(II) ions were set as: **pH = natural**, **t = 10 minutes**, **adsorbent dosage = 16 g/L.**
- The highest obtained adsorption capacity for Cu(II) ions was **12.66 mg/g.**
- The **XRD** of the Cu-laden adsorbent did not show any diffraction peaks corresponding to crystalline Cu-containing compound.
- **SEM** analysis has clearly shown the presence of nanocrystals on the surface of the adsorbent.

➢ Acknowledgements

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➢ References

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