



## **Modelling of different metal sorption mechanisms on specific biochars**

Lukáš Trakal (1) and Diederik Jacques (2)

(1) Czech University of Life Sciences Prague, Prague, Czech Republic (trakal@fzp.czu.cz), (2) Belgian Nuclear Research Centre, Belgium

Biochar is an efficient biosorbent that is being used for the removal of metals from contaminated soils. Metal sorption contains following possible mechanisms: (i) ion exchange; (ii) complexation onto free specific functional groups; and (iii) physical adsorption or surface precipitation.

While numerous studies have investigated metal uptake from solution by biochar (including the sorption mechanisms description), almost none of these have developed a modelling approach of the metal binding to biochar. In this study, we are, therefore, trying to describe the interaction of free metals with a biochar surface as (i) specific sorption to functional groups; (ii) non-specific accumulation of (counter)ions near the surface by electrostatic forces; and as (iii) (co-)precipitation, when for each specific biochar are these mechanisms individual. The specific objective of this presentation is the evaluation if the WHAM-Model VII can be used to describe specific sorption and electrostatic accumulation on biochar. In particular, the model is implemented in PHREEQC with a modified Thermoddem database for organic matter. This implementation appears to be here the most promising solution for describing sorption on biochar with a mechanistic model.