



Biochar and metal-organic framework nanocomposite: Application for immobilization of Cu in polluted industrial soil

Muhammad Tukur Bayero^{1,2}, Mahmoud Mazarji¹, Tatiana Bauer³, Tatiana Minkina¹, Svetlana Sushkova¹, Saglara Mandzhieva¹, Anna Timofeeva¹, Ridvan Kızılkaya², and Coşkun Gülser²

¹Southern Federal University, Rostov-on-Don, Russian Federation (bayeroten10@gmail.com)

²Ondokuz Mayıs University, Samsun, Turkey (ridvank@omu.edu.tr)

³Federal Research Centre the Southern Scientific Centre of the Russian Academy of Sciences, Rostov-on-Don, Russian Federation (bauertatjana@mail.ru)

Mobilization of heavy metal ions has increasingly become a serious environmental issue globally, in the contaminated soils, calling for an urgent need to find environmentally friendly materials. With the continuing maturation of research on using biochar (BC) for the remediation of contaminated soil, compositing metal-organic framework (MOF), which is a highly crystalline porous material, has gradually attracted increasing attention. Compared with BC, BC-MOF has unique underexplored potential as an amendment for immobilization of heavy metal ions, including a high specific surface area and a large number of individual functional groups. The efficacy of BC-MOF for immobilization of toxic heavy metal contaminants in soil systems was investigated in the small leaching columns. The amendments (except BC) decreased the water-soluble and exchangeable content of Cu in Technosol compared to the unpolluted soil. The presence of MOF on the BC surface contributed to the higher immobilization efficacy, which was probably due to the synergistic effects among them. The mechanism of the immobilization process on BC-MOF was proposed. The obtained results highlight the promise of utilizing BC-MOF as a remediation material for Cu immobilization in the soil.

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