SYNTHESIS OF CROSSLINKED HUMIC MATERIALS OF CONTROLLED SIZE

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Crosslinking is a perspective tool for synthesis of humic materials of the controlled size. The promising direction for achieving controlled cross-linking of humics can be incorporation of epoxy cycles. The epoxy cycles can be opened using thermal treatment or via reactions with polyamines. The objective of this study was to test the feasibility and particular features of epichlorhydrine crosslinking of HS. Leonardite humic acids (CHP) were used as the parent humic material. The latter was dissolved in 30% NaOH and added with epichlorhydrine to provide a ratio of 1 mol of CHP phenolic hydroxyls to 5 mols of epichlorhydrine. Heterophase catalyst was used. For opening the incorporated epoxy-cycles, reaction with ethylenediamine; reaction with polyethyleneamine; and heating of the product up to the boiling point were applied. The obtained derivatives were characterized using elemental and functional analyses and size exclusion chromatography. The highest linking degree was observed for the thermally treated derivatives, they were insoluble in water. The derivatives linked with amine-bridges had molecular weight exceeding the value of the parent material. The conclusion was made that the thermal method is preferred for synthesis of humic sorbents, whereas the amine-bridging can be a suitable technique for obtaining humic materials of colloidal size.

CHANGES IN ORGANIC MATTER CONTENT ON ERODED LITHUANIAN ALBELUVISOLS AND INTERNATIONAL CALIBRATION OF ANALYTICAL PROTOCOLS

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Perennial grasses can assist the accumulation of soil organic matter (SOM) and thus soil organic carbon (SOC). Therefore, it is logical that a combination of selected crop rotations, containing different species and configurations of perennial grasses, can help to both sequester SOC and to prevent soil erosion. Research data were obtained on sandy loam Eutric Albeluvisols at the Kaltinenai Research Station of the Lithuanian Institute of Agriculture (LIA) on the undulating hilly topography of the Zemaiciai Uplands of Western Lithuania. Results from 18 years of field investigations show significant increases in SOM