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Green Sustainable Process for Chemical and Environmental Engineering and Science

Green Solvents for Environmental Remediation

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Chapter 5 - Green solvents for soil and sediment remediation

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Abstract

Soil and sediment contaminations are mainly a consequence of mining, agriculture, and livestock activities, spills during transportation, warfare activities, seepage from waste storage or disposal locations, or due to industrial discharges. Discharged contaminants such as chlorinated and polycyclic aromatic hydrocarbons, pesticides and insecticides, polychloro biphenyls (PCBs), heavy metals, total petroleum hydrocarbons, and organo-metals may have long-lasting effects. These can be harmful to human life, plants and animals, and ecosystems at large. Many technologies dealing with the soil and sediment contaminations involve the use of chemical and physical methods to minimize pollutant concentrations to achieve environmental cleanup. However, the use of standard chemicals for the treatment of a polluted soil and sediment may further contaminate with their by-products. Bio-treatment using green solvents could provide efficient removal of contaminants while themselves being biodegradable and nontoxic, thus lowering the environmental impact and supporting a healthier environment. In this chapter, a concise overview is given of various sources of soil and sediment contaminants, conventional remediation technologies, green solvents (such as water, ethanol, lactic acid, ethyl lactate, supercritical fluids, and ionic liquid), and eco-friendly approaches in the utilization of these solvents for remediation of soil and sedi

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