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EDITORIAL

Preface

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This special issue is devoted to soil pollution management occurring in Europe and all over the world. The first step consists in the characterization of the site and the soil contamination followed by the selection of the best treatment methods. Among those methods, physico-chemically- and biologically-based techniques are particularly of interest. Generally, higher concentrations of an organic or metallic compound in the soil of the site of interest compared to the local background result in the decision to start a remediation process. The choice of the appropriate technique relies on a cost-benefit analysis together with the intrinsic characteristics of the site.

Among the most used, physico-chemically-based techniques mainly consist in the use of chemical compounds able to extract, or complex, and solubilize the pollutant from the solid matrix to a liquid phase. The choice of the extractant or chelant depends on the intrinsic physicochemical characteristics of the pollutants. Surfactants are required to extract hydrophobic molecules as well as the complexation abilities of chelants are used for the clean-up of metal-polluted soils. Both in situ (i.e. soil flushing) and ex situ (i.e. soil washing) methods can be implemented. These two different remediation approaches are reviewed in this special issue.

Biological treatments are more and more considered based on their low cost and low maintenance. Remediation techniques based on living organisms such as bacteria, fungi or plants, can be easy to handle but they require a perfect, or at least a good, knowledge of the soil characteristics. Considering their high resilience, these techniques are able to deal with a wide range of organic molecules, from pesticides to crude oil, and trace elements as well as radionuclides. In order to deal with heavy metals, the use of plants appears to be mandatory as phytoextraction is the only biological in situ technique. The implementation of remediation processes based on the combination of both bacteria and plants is a key point of these biological techniques as reviewed in this special issue.

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