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Dissolution of Humic Substances from Highly Humic Volcanic Ash Soil as Affected by Anionic Surfactant, Electrolyte Concentration and pH

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ABSTRACT

Dissolved humic substances separated from soils play an important role in the material cycle because they adsorb nutrients and contaminants and move with water. This study was conducted to investigate the influence of anionic surfactant, pH and electrolyte concentration on the dissolution of humic substances from a highly humic volcanic ash soil. The soil used in the experiment has a negative charge and the anionic surfactant, sodium dodecylbenzene sulfonate, has also the negative charge. The absorbance of supernatant of soil solution at different surfactant concentration and different electrolyte concentration (0.001 M, 0.01 M, 0.1 M & 0.5 M) of NaCl at pH 4.5 and 6.5 was measured at the wave-length of 400 nm; this corresponds to the relative concentration of dissolved humic substances. The surfactant adsorption and its equilibrium concentration under the same solution condition of the absorbance measurement were also measured in order to get their effect on dissolved humic substances. The zeta potential of soil particles was measured in order to evaluate the influence of electrostatic potential on dissolution of humic substances. The concentration of dissolved humic substances increased at higher surfactant concentration and adsorption, at higher pH and at lower electrolyte concentration, because the electrostatic repulsive force between the soil particles and the dissolving humic substances became larger. Therefore, surfactant concentration and adsorption, pH and electrolyte concentration are important when considering the fate of humic substances in soils.

KEYWORDS

Surfactant; Humic Substances; Electrolyte; Volcanic ash Soil; pH

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