Spectroscopic Characteristics and Behavior of Aluminum Adsorption from Different Compost-Derived Humic acid

Lin, Yong-Hong[1], Yi-Hong Lin[2] and Po-Hsin Su[3]

Abstract

Humic acid plays an important role on the distribution of heavy metal in the soil, The aims of this study were conducted to evaluate the spectroscopic characteristics and aluminum(Al) adsorption of humic acids which were extracted from four compost. The functional groups were determined by Fourier transform infrared spectroscopy (FTIR) and solid-state ^{13}C nuclear magnetic resonance spectroscopy (CPMAS ^{13}C NMR). The results showed that the aromatic groups were all found in the four composts, and the surface of humic acids contained several functional function groups, including carboxylic group, hydroxylic group and amino group. The Al adsorption by humic acid could be described by Freundlich equation. Results showed that the adsorption of Al by humic acid of compost from mixture of cattle manure and sawdust was higher than other treatments, and lower adsorption was found in the treatment from the compost of chicken manure, pig manure, lemon manure, tea manure and sawdust. The adsorptive behavior was varied with the interaction of functional groups(-OH and –COOH) with Al. This results can indicate the trasporation of Al in soil by application with organic fertilizer.

Key words: humic acid, aluminum, adsorption, Spectroscopic analysis

[1,3] Kaohsiung District Agricultural Research and Extension Station, COA, EY.
[2] Department of Mechanical Engineering, National Pingtung University of Science and Technology.