

ABSTRACT



29-4: Alkaline Extracted Humic Substances: Artifacts of the Extraction Procedure?.

Monday, January 7, 2019

10:05 AM - 10:20 AM

📍 Sheraton San Diego Hotel (Marina Tower) - Nautilus 2

The reliability of the extraction of humic substances by alkaline extractants has been frequently questioned in the past decades and was once again challenged in a recent paper (Lehmann and Kleber, 2015). Because of the importance of humic C and its widespread use as a parameter for the characterization of NOM and of a wide range of organic amendments (spanning from biosolids to compost and to anaerobic digestion effluents), it is important to re-examine the possibility of artefacts formation during the alkaline extraction.

Sphagnum moss and peats at different stages of decomposition were extracted by both alkaline and neutral solutions and extracts were fractionated according to the classic solubility scheme and to an SPE procedure. Fractions and whole extracts were quantified and characterised by UV-Vis, FT-IR and fluorescence spectroscopy.

Results show that extraction yields vary with the extractant pH: alkaline extractants do extract more organic matter from the different substrates (Fig.1). However, substances extracted from sphagnum are easily shown to differ both in their solubility properties and in their spectroscopic characteristics from humic substances extracted from peats. Both HA from poorly humified and well humified peat extracted under strong alkaline conditions display the familiar featureless UV-vis spectra which do not substantially differ from those of HA extracted from the same substrates under neutral conditions. On the contrary, the alkaline extracts of sphagnum display a well pronounced absorption peak at 290 nm (Fig.2). Fluorescence EEM confirm the difference among FA extracted from the different substrates and show that their characteristic spectral features are conserved when FA are extracted by a neutral buffered solution or distilled water. All results are coherent with the classical view of humification.

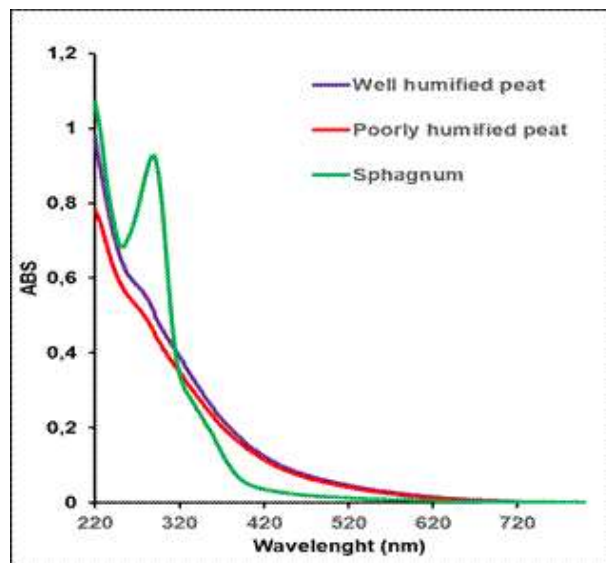
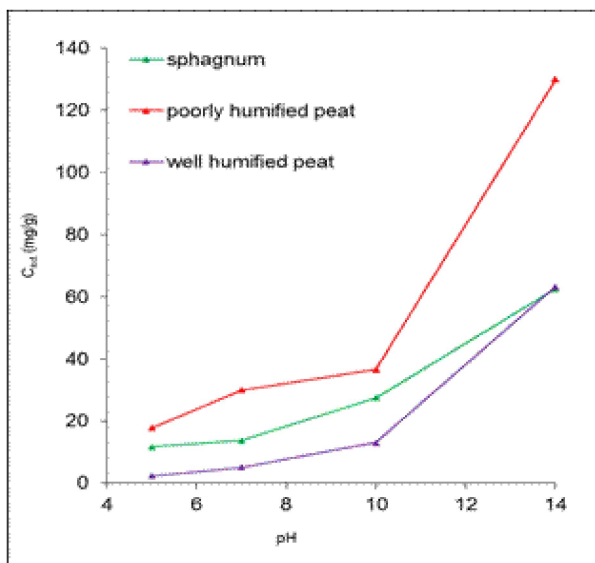


Fig.1 Extractability of organic matter as function of extractant pH. Fig.2 UV-VIS spectra of HA extracted with 0.5M NaOH.

Fig.2 UV-VIS spectra of HA extracted with 0.5M NaOH.

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