

## CHEMICAL AND SPECTROSCOPIC MEASUREMENTS ON THE HUMIC ACIDS EXTRACTED FROM SOME ORGANIC COMPOSTS

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### ABSTRACT

Humic acids were extracted from different composts and have been characterized by chemical and spectroscopic methods. Meaningful differences in the composition were revealed by UV, Visible and IR spectroscopies. The obtained data showed that carbon, hydrogen and nitrogen of the studied humic acids were slightly affected by the source of the humic acids, indicating that these humic acids appeared to be closely related structurally. However, the C/H and O/H values for Yan-HA were higher than the other humic acids. This could indicate that this humic acid is more humified and in a more condensed state. The UV and Visible spectra of the isolated humic acids exhibited the same trend showing no minimum or maximum absorption. San-HA and Enz-HA have the lowest value of  $E_4/E_6$  ratio indicating a higher degree of aromatic condensation and low aliphatic structure. The IR spectra of the studied humic acids indicated that, there was a broad similarity among the different humic acids studied. The intensities of the absorption band vary slightly from one to other. They differ mainly in the ratios of the number of functional groups and the degree of polymerization. On the other hand, humic acid extracted from sludge (Bos-HA) contains the highest percentage of aliphatic carbon, associated with polysaccharides structures.

**Keywords:** Compost, humic acids(HA), elemental analysis, UV& visible absorption, IR spectroscopy.

### INTRODUCTION

Humic substances and its composition are important diagnostic criteria that reflect the nature and direction of the present soil formation process. These materials arise from the chemical and biological degradation of plant and animal residues and from synthetic activities of microorganisms (Schnitzer,1978). Humic substances are dark-coloured, acidic, predominantly aromatic, hydrophilic, chemically complex and polyelectrolyte-like materials that range in molecular weights from a few hundreds to several thousands (Stevenson,1982 and Soler Rovira *et al.*2002).The elementary analysis of humic acids provides information on the distribution of carbon, hydrogen, nitrogen and oxygen. Humic acid elemental composition is usually in the range: C, 43.8 to 58.7%; H, 3.2 to 6.2%; N, 0.8 to 4.3% and O, 32.8 to 38.3% (Schnitzer,1978). The O/H mole ratio for soil humic acids is usually about 0.5, while the C/H mole ratio is approximately 1.0 (Steelink, 1985). Taha (1991) and Abo El-fadl *et al.*(1992) reported that humic acids are chemically similar, but they different in molecular weight and ultimate analysis.

The spectroscopic investigations of humic acids in the UV region (200-400 nm) and visible region (400-800 nm) are important for both the