

Charge-Transfer Interaction in a Humic Acid

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A sample of humic acid (0.3 g, described in Ref. 1) was heated under reflux in a Soxhlet tube with 350 ml of 2 % hydrochloric acid. Some yellow fulvic acid was released and the reflux was repeated with a new portion of hydrochloric acid until no colour was seen in the liquid leaving the Soxhlet tube. Powdered 1,2-dihydroxybenzene (4 g) was then placed on top of the humic acid specimen and reflux was started again. The humic acid immediately started to dissolve, and after 14 successive additions of totally 110 g of 1,2-dihydroxybenzene almost all the humic acid was brought into solution.

When the solution was dialysed against 2 % hydrochloric acid the humic acid precipitated again.

The interaction with 1,2-dihydroxybenzene has thus affected the cohesive interaction between the humic acid molecules. A typical property of the phenol used is its charge-transfer donor prop-

erties, and the charge-transfer interaction with humic acid has been established by spectroscopic studies.¹ It therefore seems most reasonable to assume that charge-transfer interactions between humic acid molecules have been disrupted.

Leaching with 1,2-dihydroxybenzene in hydrochloric acid can also be performed by successive treatments at room temperature, but it then proceeds much slower. During leaching, fractionation of the leached humic acid can be observed, and this will be studied further.

References

1. Lindqvist, I. *Swedish J. Agric. Res.* 12 (1982) 105.
2. Lindqvist, I. *Swedish J. Agric. Res.* 13 (1983) 202.

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