STUDIES ON CORRELATION BETWEEN SPECTROSCOPIC AND ELECTROCHEMICAL DATA

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The absorption maximum E_{max} of dilute ($< 10^{-4}$M) aqueous iodide solutions shifts progressively to higher energies on addition of various alkali chlorides (up to 10M for LiCl). The shift (ΔE_{max}), which increases with increasing ration radius, is due to coulombic interactions affecting the ground state stabilization of the solvated iodideion. For $>$ 1 M solutions these interactions are interpreted as a combination of the Debye-Hückel charge cloud and the quasi-(diffuse, expanded) lattice interactions, the relative proportions of which are here determined using the molar volume in the solid state of the added salt. This interpretation is based on the observed linearity of ΔE_{max} with $\sqrt{c}$ (c = concentration of added electrolyte) between 1 and 4M, and with $\sqrt[3]{c}$ between 2 and 10M. The combination of these observations leads also to structural data on concentrated salt solutions, and calculated values for Madelung constants and interionic distances, which are close to experimental values. Free energies of solvation at infinite dilution correlate linearity with the extrapolated intercept at zero concentration.

A discussion is given why the Debye-Hückel limiting law, which only applies in conductivity studies up to around 10^{-2}M is here operative only above 1 M. The nature of the shifts in E_{max} below this latter concentration yield additional information on the structure of salt solutions.

References :

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ADSORPTION STUDIES OF MCPA AND PARAQUAT ON BORALESGAMUWA KAOLIN

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MCPA and Paraquat are extensively used as pesticides. However, the adsorption of these on soils may lead to pollution of the soil micro-environment and can interfere with the soil organisms. Some of the adsorbed species may be inactivated on the soil while others may be leached out. In this study the adsorption and desorption of MCPA and Paraquat on clay kaolinite has been studied, as the clay fraction is the main adsorbent in soils.

The adsorption of MCPA is high (230 μmol g^{-1}) and is about eight times that of paraquat (32 μmol g^{-1}.) The adsorption in both cases was seen to be of the Langmuir type. The big difference in the adsorption of MCPA and paraquat can be rationalised in terms of the structures of the pesticides and kaolin. Variable temperature studies (25°C-55°C) indicated very little change in the amount of adsorption over the temperature range studied.

Desorption studies showed that these pesticides can be easily desorbed although a slight hysteresis effect was observed.