MAGNETIC SUSCEPTIBILITY OF IODIC ACID IN AQ. SOLUTION (CONSTITUTION OF IODIC ACID)

IN a previous communication to *Current Science*[1] and in a detailed paper[2] it was pointed out that in the case of aqueous solutions of Iodic acid a number of properties, *e.g.*, density, viscosity, parachor, refractive index, temperature coefficient of conductivity, all showed a remarkable similarity in their curves which exhibited breaks at 0·04 N and 0·09 N.

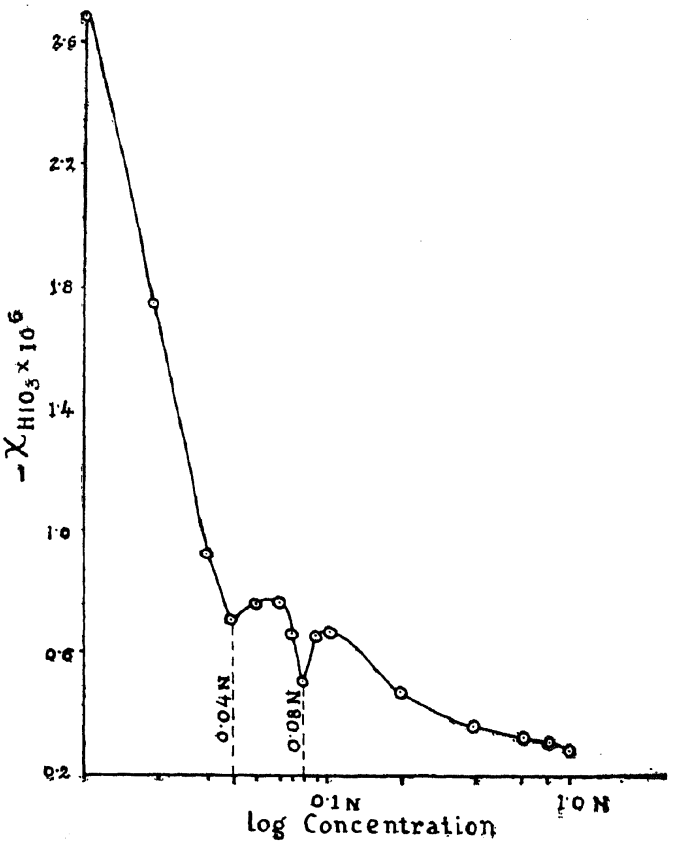
In the present investigation the magnetic susceptibility of the aqueous solution of the acid at different concentrations has been measured, and the mass susceptibility determined and plotted against concentration. The susceptibility measurements have been carried out previously by S. R. Rao and Sriraman[3] by means of a Curie balance at concentrations ranging from 17 per cent. to 76 per cent. from which they concluded that "no systematic variation was obtained when the concentration was varied". In our case we used a modified form of Decker's balance with a special device for temperature control. The region of concentration investigated was between 0·01 N and 1·0 N, that is, below that of the previous workers. The following formulæ were used to evaluate firstly the susceptibility of the solution, and from that the mass susceptibility of the solute:—

$$(1)\quad \chi_{sol}\cdot\rho_{sol} = \chi_w\cdot\rho_w + (\chi_w\cdot\rho_w - \chi_a\rho_a)\cdot\frac{\theta_w-\theta_{sol}}{\theta_a-\theta_w}$$

$$(2)\quad \chi_{sol} = C_s\cdot\chi_s + (1-C_s)\chi_w$$

where χ_{sol}, χ_w, χ_a are the susceptibilities of the solution, water and air, ρ_{sol}, ρ_w, ρ_a are the densities of the solution concerned, water and air, and θ_{sol}, θ_w, θ_a are the deflections for solution, water and air respectively, and in the second equation C_s is the concentration, χ_s the mass susceptibility of the solute, and χ_w the mass susceptibility of water.

It will be observed that the curve shows two breaks at 0·04 N and 0·08 N. These correspond remarkably well with similar breaks in the curves obtained with other properties and were explained as due to transition points arising



from the polymerisation of Iodic acid according to the scheme:

$$HIO_3 \leftrightarrows \tfrac{1}{2}(HIO_3)_2 \leftrightarrows \tfrac{1}{3}(HIO_3)_3.$$

The detailed paper will appear elsewhere. Our thanks are due to Dr. K. N. Mathur for the construction of the magnetic balance which is of remarkable sensitivity.

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[1] *Curr. Sci.*, 1939, **8**, 73.

[2] M. R. Nayar Srivastava, Sen, Ramgopal & Sharma, *Z. anorg. u. allg. Chem.*, 1939, **240**, 217.

[3] *Phil. Mag.*, 1937, **24**, 1030.

SYNTHESIS OF *dl*, ANALOBINE-*O*-METHYL ETHER (*dl*-2, METHOXY-5, 6 METHYLENE DIOXY-NOR-APORPHINE)

ANALOBINE, an alkaloid obtained from *Asimina triloba* was assigned the following constitution by Manske[1] on the basis of analytical data: