

## SHORT COMMUNICATIONS

## The electrophoretic mobilities of inorganic ions in some inorganic and organic acids

In connection with our previous papers<sup>1</sup> concerning the electrophoretic mobilities of the halogeno-complexes of Hg, Bi, Cd, Pb and Cu, we have made a systematic investigation of the electrophoretic mobilities of about 90 inorganic ions in some inorganic and organic acids. The concentrations of the acids varied from 0.4 to 6.3 *N*.

Some of the mobility data obtained by heavy current and high voltage electrophoresis on filter paper<sup>1</sup> are represented here in diagrams as a function of the logarithm of the concentrations of hydrochloric, perchloric, nitric, sulphuric, acetic, citric, tartaric and lactic acids (Figs. 1 and 2).

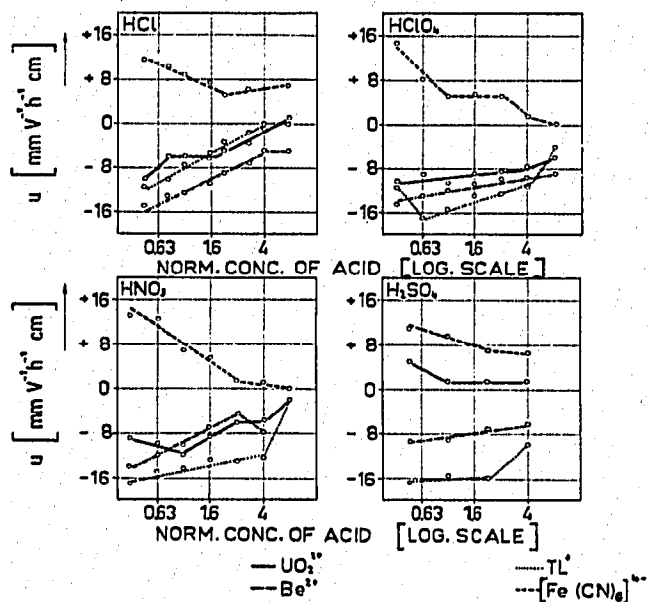


Fig. 1. Diagrams of the electrophoretic mobilities of  $\text{UO}_2^{+2}$ ,  $\text{Tl}^+$ ,  $\text{Be}^{+2}$  and  $[\text{Fe}(\text{CN})_6]^{-4}$  in some inorganic acids.

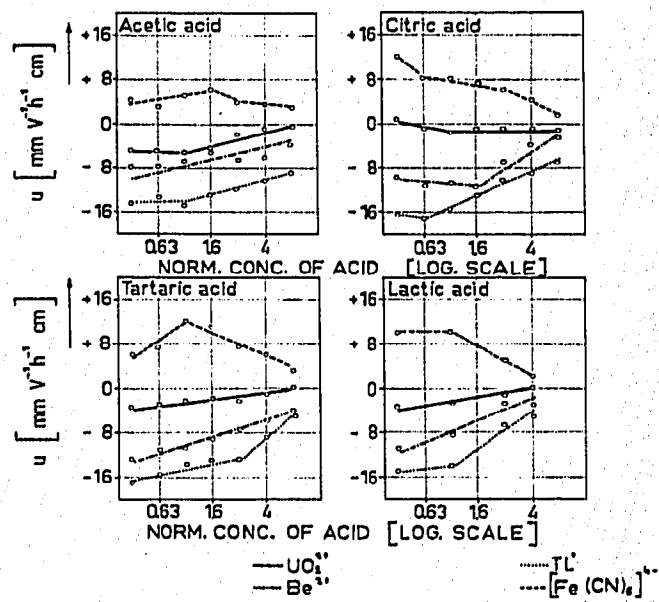


Fig. 2. Diagrams of the electrophoretic mobilities of  $\text{UO}_2^{+2}$ ,  $\text{Tl}^+$ ,  $\text{Be}^{+2}$  and  $[\text{Fe}(\text{CN})_6]^{-4}$  in some organic acids.

The mobilities of four inorganics are reported here:  $\text{UO}_2^{+2}$ ,  $\text{Tl}^+$ ,  $\text{Bi}^{+2}$  and  $[\text{Fe}(\text{CN})_6]^{-4}$ . The filter paper used was Munktell No. 20/100. The mobility data were corrected according to the equation<sup>1</sup>:

$$u = 1.2 \left( \frac{u'}{R_F} - \frac{u'_e}{R_{Fe}} \right) [\text{mm V}^{-1} \text{h}^{-1} \text{cm}]$$

where  $u'$  is the apparent mobility of the ion investigated,  $u'_e$  the apparent electro-osmotic mobility,  $R_F$  the adsorption chromatographic factor on filter paper of the ion investigated,  $R_{Fe}$  the adsorption chromatographic factor of the substance used to determine the electro-osmotic flow (glucose), and 1.2 is the correction factor for the porosity and structure of the filter paper used. The apparent shift of the spots is

measured in millimeters (mm), the apparent electric field strength in volts per centimeter (V/cm), and the time in hours (h). The resulting mobilities [ $\text{mm V}^{-1} \text{h}^{-1} \text{cm}$ ] can be transformed to [ $\text{cm}^2 \text{V}^{-1} \text{sec}^{-1}$ ] by multiplying them with the factor  $0.278 \cdot 10^{-4}$ .

The diagrams in Figs. 1 and 2 show characteristic slopes, breaks and parallelisms.

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<sup>1</sup> Z. PUČAR, *Anal. Chim. Acta*, 17 (1957) 476; 17 (1957) 485; 18 (1958) 290.

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### Paper chromatographic reagents in aerosol spray bottles

During the last few years numerous cosmetic products have been marketed in aerosol bottles that are fitted with a nozzle and stop valve, by means of which the contents are dispensed as a fine spray. Low boiling halogenated hydrocarbons are generally used as propellants. These are present in the bottle in the liquid state under a certain pressure. For practical purposes the stop valve and nozzle are constructed as a unit that can be operated by pressing one finger on the nozzle. The author thought that this arrangement might be suitable for spraying chromatograms.

An experiment was carried out with a solution of *p*-anisidine phosphate in ethanol. This reagent, which is usually employed for the detection of sugars on chromatograms, was filled into an aerosol bottle together with the propellant. The bottle was made of aluminium and was covered inside with an epoxy protective. Some chromatograms were sprayed with the bottle and others, for comparison, with an ordinary glass sprayer. The advantages of the aerosol bottle were a more uniform distribution of the reagent and simpler handling, since only one finger need be used instead of the two hands required to manipulate an ordinary glass spraying apparatus. Another advantage of the aerosol bottle is that it is always ready for use and need not be cleaned after use.

Of course, there may be limitations to its use. It may be dangerous, for example, to use it with alkalis in ethanol (risk of injuries to eyes, etc.). Corrosion of the bottle may also occur with some reagents; however, materials resistant to most chemicals are already known. From the manufacturing point of view, the rapid evolution of paper chromatography, giving rise to a continual change of reagents, may discourage chemical dealers from launching such aerosol bottles on the market. However, this does not apply, for example, to the ninhydrin reagent. It is felt that the introduction of aerosol bottles could be promoted by research institutes and industrial laboratories and the author would be grateful for encouragement in this direction.

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