Comments on the Note "A Re-Analysis of Some Conductance Data" by B. A. Akrawi, W. H. Lee and R. J. Wheaton

PER BERONIUS

Department of Physical Chemistry, University of Umeå, S-901 87 Umeå, Sweden

In the Akrawi *et al.* contribution [1] to the interpretation of the distance parameter [2-27] in electrolytic conductance theory, a problem which has for a long time past been subject to much controversy, it is claimed that the distance parameter, R, approaches the Bjerrum radius, q, in low dielectric constant solvents. The evidence of this conclusion, which is based on calculations using a conductance equation derived in a series of papers by Lee and Wheaton,[28-30] is not convincing. This conductance equation, the derivation of which starts from a model almost identical to that proposed by Fuoss,[19-20] will be referred to as the Fuoss-Lee-Wheaton (FLW) equation.

In general, it is not possible to obtain a unique value of the distance parameter from electrical conductance data, *cf.* Refs. 31-33. The experimental points (c,Λ) may be equally well reproduced over a range of R values. In other words the goodness of fit is frequently quite insensitive to the value of the distance parameter. In this respect the FLW equation [30] appears to be no exception to other conductance equations, *e.g.* the extended Fuoss-Hsia [34-36] and Pitts' [37,38] equations, and the Fuoss 1978 equation.[27]

The model on which the FLW equation is based allows for solvent separated as well as contact ion pairs. It may be noted that this equation and the extended Fuoss-Hsia (FHFP) equation,[34-36] which is based on the hard spheres model, yield almost identical association constants (K_A) for values of K_A exceeding about 15. A few examples are given in Table 1.

Table 1. Comparison of ion pair association constants (molarity scale) according to FLW and FHFP conductance equations at 25 °C.

Solvent	Salt	R Å	$K_A \times 10^{-3}$ FLW	$K_A \times 10^{-3}$ FHFP
Ethanol [39]	NaI	9.1	0.0558	0.0506
	KI	9.1	0.0819	0.0767
	RbI	8.6	0.1054	0.0980
	CsI	10.3	0.1405	0.1410
1-Butanol [40]	RbI	18.4	1.70	1.74
1-Octanol [41]	NaI	28.5	40.1	39.8
1-Octanol [42]	LiBr	28.5	56.4	57.1

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