A B S T R A C T

The EMF's of the cell

$$H_{2(g)}|Pt|HCl(m)\ TMU(X)\ H_2O\ (100-X)|AgCl_{(s)}|Ag_{(s)}$$

$$m = 0.002 \text{ to } 0.020 \text{ molal}$$

were used to determine the standard potential of the silver-silver chloride electrode at 30°C in a 5 wt% tetramethylurea-water mixture. The mean molal activity coefficient of hydrochloric acid, the primary medium effect and the free energy of transfer of hydrochloric acid from water to the tetramethylurea-water mixture were also obtained from the data. Difficulties in devising a suitable hydrogen electrode for this solvent medium limited the acquisition of data to this single composition and temperature. A review of recommended plating procedures employed for the hydrogen electrode for use in both pure organic solvents and their aqueous mixtures, has been made. The results obtained for hydrochloric acid in the 5 wt% tetramethylurea-water mixture are discussed relative to other 5 wt% organic-aqueous mixtures in terms of structural effects and hydrogen bonding.