

Adsorption of Perchlorate Ions at the Au(100)/Aqueous  
Solution Interface

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The temperature coefficients of double layer parameters are very sensitive to the structure and composition of the electrochemical interphase and, in the absence of specific adsorption, give information on the entropic contribution arising from the solvent<sup>1</sup>.

The effect of temperature on the differential capacity - potential curves,  $C(E)$ , has been established recently for some gold faces<sup>2,6</sup> but there are still some difficulties in the interpretation of the results due to the possible influence of specific adsorption of perchlorate ions.

For the (100) gold single crystal face,  $C(E)$  curves were measured in perchloric acid solutions with concentrations ranging from  $2 \times 10^{-3}$  M to 1 M, at different temperatures. The hanging electrolyte method was used together with a two compartment cell in isothermal conditions.

On positive sweeps of the triangular potential wave imposed, significant changes on the  $C(E)$  curves were observed for different values of the negative potential limit at constant concentration, however, such differences were not detected on the negative sweeps of the potential being the  $C(E)$  curves independent of the negative potential limit. The dependence of the differential capacity on the concentration of perchlorate ion, and in particular, of the potential of capacity minimum was studied and will be presented. The entropy of formation of the interface was calculated and will be discussed in comparison with other single crystal gold faces<sup>7</sup>.

References:

- 1- G. Hills and F. Silva, Can. J. Chem., 59 (1981) 1835.
- 2- F. Silva, A. Hamelin and R. Parsons, Abstracts of the 34<sup>th</sup> I.S.E. Meeting, Erlangen, W. Germany, 1983, p.930
- 3- A. Hamelin, L. Stoicoviciu, F. Silva and M. J. Sottomayor, Abstracts of the 36<sup>th</sup> I.S.E. Meeting, Salamanca, Spain, 1985, p.9110.
- 4- F. Silva, M. J. Sottomayor and A. Hamelin, Abstracts of the International Conference on " Structure and Dynamics of Solid/ Electrolyte Interfaces", Berlin, W. Germany, 1986.
- 6- A. Hamelin, L. Stoicoviciu and F. Silva, J. Electroanal. Chem., in press.
- 7- A. Hamelin, L. Stoicoviciu and F. Silva, J. Electroanal. Chem., in press.

**The effect of temperature on the differential capacity of the interface between Mercury - and aqueous solutions of Manitol, Sorbitol and Dulcitol**

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R. Peat and S. Shannon<sup>1</sup> reported that there was a marked difference in the differential capacity - potential curves,  $C(E)$ , of Hg in contact with two biologically important and isomer polyalcohols: manitol and sorbitol. The structure of dulcitol differs also from that of sorbitol only by the position of one hydroxyl group. A study of the adsorption of manitol, sorbitol and dulcitol on Hg from aqueous sodium chloride solutions in a range of solute concentrations and temperatures was then undertaken. The characteristics of adsorption at constant temperature was reported elsewhere<sup>2</sup> and here account is given on the effect of temperature on the differential capacity curves.

At constant concentration the effect of temperature on the differential capacity curves is similar for each compound, figs 1-a, b, e c, i.e. two regions of opposite temperature coefficients are discernible on the  $C(E)$  curves, but the form of the curves remains the same.

The entropy of formation of the interface,  $S^*$ , in the presence of each polyalcohol was obtained after double integration of the values of the temperature coefficients of  $C(q)$ , and using as integration constant the temperature coefficient of the  $pzc^3$  and will be presented. The dependence of the charge of maximum entropy of formation on the nature of the polyalcohol will be discussed in relation with interfacial solvent properties.