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Lippman's equation

An equation which gives the electric charge per unit area of an interface (electrode):

$$\left(\frac{\partial \gamma}{\partial E_{\mathrm{A}}}\right)_{T,p,\mu_i \neq \mu} = -Q_{\mathrm{A}}$$

where γ is the interfacial tension, E_{A} is the potential of a cell in which the reference electrode has an interfacial equilibrium with one of the ionic components of A, Q_{A} is the charge on unit area of the interface, μ_i is the chemical potential of the combination of species i whose net charge is zero, T is the thermodynamic temperature and p is the external pressure. Since more than one type of reference electrode may be chosen, more than one quantity Q may be obtained. Consequently Q cannot be considered as equivalent to the physical charge on a particular region of the interphase. It is in fact an alternative way of expressing a surface excess or combination of surface excess of charged species.

Source:
PAC, 1974, *37*, 499 *(Electrochemical nomenclature)* on page 508
PAC, 1986, *58*, 437 *(Interphases in systems of conducting phases (Recommendations 1985))* on page 445

