

electrocapillary equation

A form of the Gibbs adsorption equation which includes an expression of the phenomenon of electrocapillarity:

$$s \, dT - \tau \, dp + d\gamma + \sigma^\alpha \, dE + \sum \Gamma_j \, d\mu_j = 0$$

where s is the surface excess of entropy of unit area of interphase, T is the temperature, τ is the thickness or excess volume of unit area of the interphase, p is the external pressure, γ is the interfacial tension, σ^α is the free surface charge density on phase α (areal amount of charge on the surface of phase α), E is the generalized potential, Γ_j is the surface excess, μ_j is the chemical potential and j is an electrically neutral component of one or other of the phases; the sum is over all the components but one in each phase.

Source:

PAC, 1986, 58, 437 (*Interphases in systems of conducting phases (Recommendations 1985)*) on page 446