$$= [(\delta_i - \delta_v)^2 - (\delta_i - \delta_s)^2]V_i/2.3\,RT \qquad [7]$$

II. GENERAL APPLICATIONS OF REGULAR SOLUTION THEORY TO PARTITIONING PROCESSES

Various forms of Eq. 6 and of relationships between δ values and bioactivity have been used successfully to describe a number of biological processes besides percutaneous absorption. Ferguson (6) showed that the toxic concentration of a chemical was a function of the intrinsic toxicity of the chemical and its distribution into a target phase. Here, the distribution is given by the difference in the partial molal free energies of the chemical (phase 1) in its standard state in two phases (phases 2 and 3; Eq. 8), where, for example, the molal free energy of the chemical in phase 2 is given by 2.3 RT log $\gamma_{i,2}$ (7).

$$\log K = (\bar{F}_3^0 - \bar{F}_2^0)/2.3\ RT \qquad [8]$$

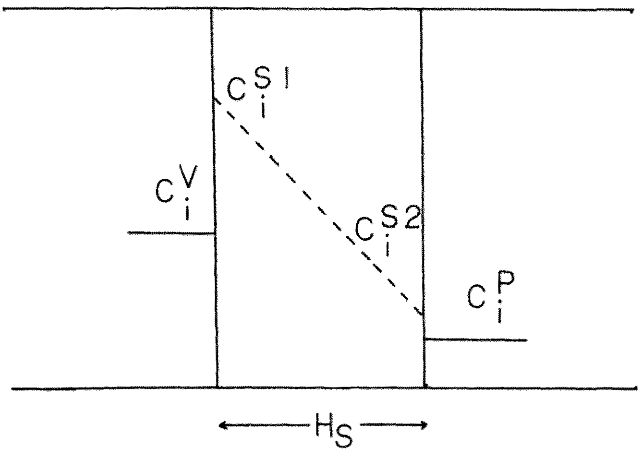

Figure 13.1 Concentration gradient of a solute (i) across a membrane of thickness h_s where C_i^V is the concentration of the solute in the vehicle in the donor phase and C_i^p is the concentration of the solute in the plasma in the receptor phase. C_i^{s1} and C_i^{s2} are the concentrations of the solute in the first and last layers of the membrane, respectively.