Equilibrium adsorption of proteins

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The adsorption of bovine serum albumin (BSA) at an air/water interface was shown to be reversible and the equilibrium adsorption isotherm measured for concentrations between 0.001% and 10.0%. The desorption of BSA into a subphase of zero concentration was measured as a function of surface pressure and the kinetics shown to be diffusion controlled. The subsurface layer concentrations of BSA calculated from plots of desorption rate vs. t- 1 2 were considerably less than the activities expected from the adsorption isotherm. This is explained by a very large activation energy barrier to the desorption step. The magnitude of this barrier, expressed in terms of an interfacial resistance, was estimated to be of the order of 108 sec cm-1 for BSA at a surface pressure of 25.6 dynes cm-1. Some of the reasons for the widely held belief that adsorption of proteins and many polymers is irreversible are discussed, and the use of equilibrium surface pressures for the calculation of thermodynamic prop