# Probelms

- **5.3:** A cholesterol monolayer has an area of 0.405 and 0.40 $nm^2$ molecule$^{-1}$ at 5 and 20 mN m$^{-1}$ respectively and a monolayer of dipalmitoyl phosphatidylcholine (DPPC) has areas of 0.68 and 0.43 $nm^2$ molecule$^{-1}$ at these surface pressures. The corresponding areas for a mixed monolayer consisting of 1:3.4 cholesterol:DPPC are 0.38 and 0.40 $nm^2$ molecule$^{-1}$. Calculate the excess areas of mixing at these two surface pressures.

- **6.4** After equilibration the Donnan potential across a membrane separating a solution of a negatively charged polyelectrolyte and a solution of sodium chloride is found to be 45 mV (with the polyelectrolyte solution at the lower potential). Calculate the ratio of sodium ion concentrations in the two solutions. (Ignore any osmotic movement).

- **5.2**: Calculate the average molar mass and molecular area of egg albumin from the data in the table. The data refer to a monolayer of egg albumin spread on water in a film balance at 25°C.

- **Ch. 13 Problem 3.**

| Surface Pressure, $\Pi$ / mN m$^{-1}$ | Area, $A$ / m$^2$ mg$^{-1}$ |
|---|---|
| 0.07 | 2.00 |
| 0.11 | 1.64 |
| 0.18 | 1.50 |
| 0.20 | 1.45 |
| 0.26 | 1.38 |
| 0.33 | 1.36 |
| 0.38 | 1.32 |