

Environmental Geotechniques – Engi 7718
Assignment No. 4
Due Thursday 21 June 2006

1) After batch tests were conducted the following data was obtained:

C_e (mmol/kg)	0.06	1.35	3.23	5.07	6.85
q_e (mmol/kg)	195	264	280	291	305

- a) Use the data to calculate the Langmuir adsorption isotherm equation.
- b) Use the data to calculate the Freundlich adsorption equation.
- c) Plot the three curves of the data, the Langmuir adsorption isotherm and the Freundlich adsorption isotherm on one graph to show the goodness of fit of the two models with the data.
- d) What is the maximum amount of adsorption predicted by the Langmuir equation?

2) The chemical compound Acrylonitrile (C_3H_3N) has a solubility of 76,800 mg/l and a vapour pressure of 83 mm Hg and the solubility and the vapour pressure were each measured at the same temperature. One literature reported value of the Henry's Law constant for this compound is 1.1×10^{-4} (atm·m³)/mole.

- a) Calculate the Henry's constant from the solubility and vapour pressure data,
- b) Discuss how it compares with the Henry's constant provided.