

## I) Mg-EDTA Complexation

Consider a  $\text{Na}_2\text{MgY}$  solution with a total concentration of  $1.50 \times 10^{-3} \text{ M}$ . The solution is also buffered to a pH of 9.75, where the alpha fraction for  $\text{Y}^{4-}$  is 0.236.

a) Calculate the  $\text{pMg} = -\log[\text{Mg}^{2+}]$  for this solution.

b) Calculate the  $\text{pMg} = -\log[\text{Mg}^{2+}]$  for a solution with a total  $\text{Na}_2\text{MgY}$  concentration of  $1.50 \times 10^{-3} \text{ M}$  and a total EDTA concentration of 0.0100M.

For the  $\text{MgY}^{2-}$  complex,  $\log K_f = 8.69$ .

## 2) Complexation Equilibria

Acetic acid (HOAc) is a monoprotic acid with a  $pK_a = 4.75$ .  $Cu^{2+}$  ions will bind with up to two acetate ions ( $OAc^-$ ).

Consider a solution that (i) has a total copper concentration of  $3.50 \times 10^{-7}$  M, (ii) has a total acetic acid concentration of 0.3750 M, and (iii) is buffered to a pH of 6.00.

- Write down (i) the total number and (ii) the chemical formulae of ALL of the copper species that exist in this solution.
- Calculate the acetate concentration ( $[OAc^-]$ ) in this solution.
- Calculate the  $Cu^{2+}$  ion concentration in this solution.