1. (25 p)What concentration of NaOH, in mg/L, would be required to increase the pH of wastewater initially containing 200 mg/L HCl to 7? H = 1 g/mol; Na = 24 g/mol; O = 16 g/mol; Cl = 35.5 g/mol. Assume that there are no weak acids (or buffers) in this waste.
2. (25 p) What concentration of Na2CO3, in mg/L, would be required to increase the pH of wastewater initially containing 200 mg/L HCl to 7? H = 1 g/mol; Na = 24 g/mol; C = 12 g/mol; O = 16 g/mol; Cl = 35.5 g/mol. Assume that there are no weak acids (or buffers) in this waste.
3. A vinegar producing plant produces a wastewater containing 200 mg/L of acetic acid (CH3COOH)
4. ( 10 p.) Assuming that there are no other weak acid in this waste, calculate the equilibrium pH of the wastewater? Note that CH3COOH = 60 g/mol; Na = 23 g/mol; O = 16 g/mol; C = 12 g/mol; H = 1 g/mol

1. (15 p.)Assuming there are no carbonate species in the wastewater, calculate the dose of strong base, NaOH, required to raise the pH of the wastewater in part (a) to pH 7.
2. A solution is prepared by dissolving 5 g H2SO4 in pure water to make a total volume of 1 L.
3. (5 p) What is the pH of the solution?
4. (10 p) What mass of the strong base NaOH would be required to neutralize the solution?
5. (10 p) If NaOH is available as a 0.1 M solution, what volume of the basic solution will be needed to neutralize the acid?