

(Please answer each question on a separate sheet of paper.)

1. To a 72.0 mL solution of 0.250 M chlorous acid ( $pK_a = 1.94$ ) is added 10.0 mL of 1.00 M sodium hydroxide. What is the final pH of the solution?
2. Sketch titration curves for 0.10 M solutions of each of the following diprotic acids with 1.0 M sodium hydroxide:
  - a. "Kevinic acid" ( $pK_{a,1} = 2.3$ ,  $pK_{a,2} = 7.6$ )
  - b. "Riceous acid" ( $pK_{a,1} = 7.2$ ,  $pK_{a,2} = 8.0$ )
3. If you wanted to make a buffer solution at pH 7.5 using "Riceous acid", what volume of 1.0 M HCl would you need to add to a solution containing 0.650 mole of the fully deprotonated molecule (*e.g.* its sodium salt)? Include all calculations – show your work!