Name: _____ Class: _____ Date: _____ ID: A

**Acid Base Pre-test**

**Multiple Choice**

*Identify the choice that best completes the statement or answers the question.*

b 1. All things that are acidic will eventually produce
   a. $OH^-$ c. HCl
   b. $H_3O^+$ d. $H_2O$

a 2. All things that are basic will eventually produce
   a. $OH^-$ c. HCl
   b. $H_3O^+$ d. $H_2O$

c 3. $HNO_2(aq)$ is an oxy-acid. Which of the following would best describe its name
   a. nitric acid c. nitrous acid
   b. hydro nitric acid d. Nitrogen dioxide acid

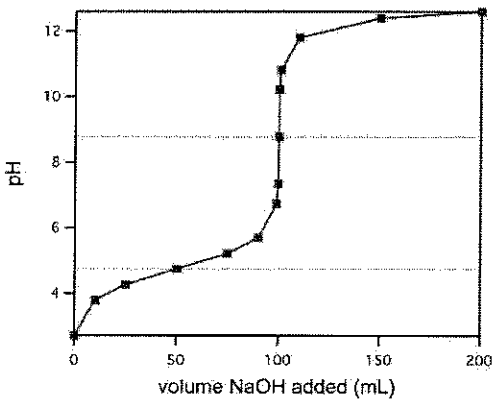
a 4. Which of the following acids is considered the strongest?
   a. .1M Ka = 1.5 E-3 - largest number c. .1M Ka = 1.5E-10
   b. .2M Ka = 1.5 E -7 d. 2M Ka = 1.5E-12

b 5. A .1M HCl solution is titrated against an unknown NaOH solution. 10mL of the .1M HCl is required to reach the equivalency point of 10 mL of NaOH. What is the concentration of the NaOH.
   a. .05M c. .15M
   b. .1M d. .2M

a 6. 10mL of .1M NaOH is required to neutralize 20ml of unknown HCl. What is the concentration of the HCl.
   a. .05M c. .2M
   b. .1M d. .4M

d 7. What are the products of the neutralization reaction between HCl and LiOH
   a. $H_2O$ c. $H_3O^+$ & $OH^-$
   b. LiCl d. $H_2O$ & LiCl

c 8. Caffeine is weakly basic. In which pH range does caffeine test?
   a. 0-2 c. 8-12
   b. 3-6 d. 13-14




d 9. In the graph above, at what point does the equivalence point occur?
   a. 25 mL c. 75 mL
   b. 50 mL d. 100 mL

10. If a solution is neutral, which of the following must be true?
    a. $[H_3O^+] = [OH^-]$
    b. $[H_3O^+] > [OH^-]$
    c. $[H_3O^+] < [OH^-]$
    d. $[OH^-] = [H_2O]$

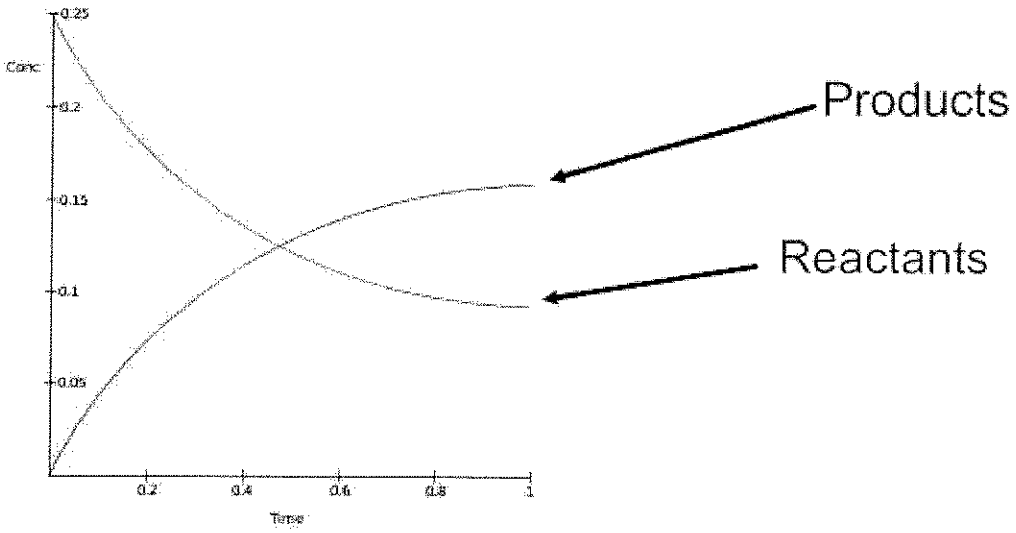
11. If a solution has a pH of 1 then the pOH =
    a. 0
    b. 1
    c. 13
    d. 14

12. If a solution has a pOH = 1 , it is also considered
    a. acidic
    b. basic
    c. neutral
    d. can not be determined

13. Phenolphthalein is all of the following **EXCEPT**
    a. neutral
    b. chemical indicator
    c. pink in bases
    d. greenish/yellow in acids

14. The Ka of Hydrochloric acid is
    a. 1.0 E-14
    b. 1.0 E -7
    c. 1
    d. extremely large

15. Ammonium is a well known weak acid. (ammonium = $NH_4^+$). Which of the following would be the hydrolysis reaction for ammonium.
    a. $NH_4^+ + NH_3 \Rightarrow H_2O$
    b. $NH_4^+ + H_2O \Rightarrow NH_3 + OH^{-1}$
    c. $NH_4^+ + H_2O \Rightarrow NH_3 + H_3O^+$
    d. $NH_3 + H_2O \Rightarrow NH_4^+ + OH^-$




16.
See graph above.
Which of the following is NOT true
    a. This reaction goes to completion
    b. This reaction is product favored
    c. This reaction has a K > 1
    d. This reaction has both forward and reverse reactions running at all times.

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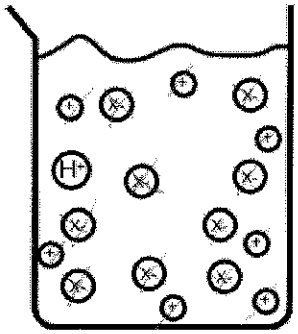
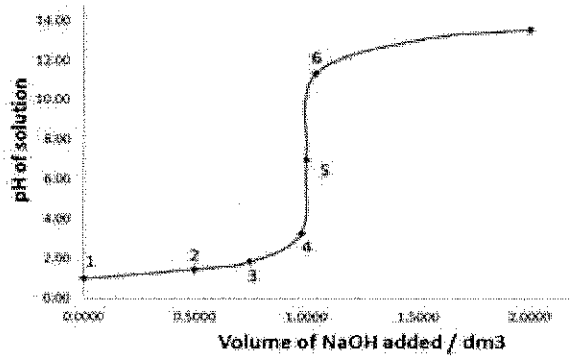
b 17. Which of the following is not a strong acid?

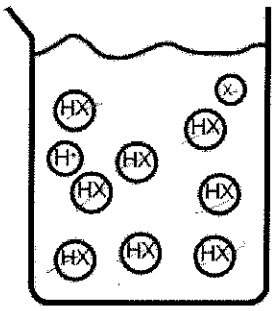
a. HCl
b. HF
c. HBr
d. HI

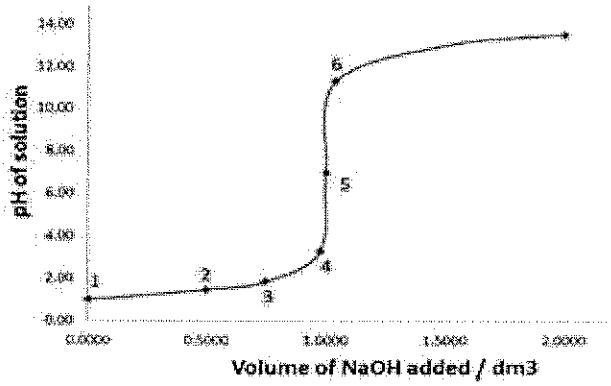





____ 18. Which number from the titration curve would demonstrate the picture above

a. 1
b. 2
c. 3
d. 4
e. 5






a 19. Which number would indicate a picture of the drawing above?

a. 1
b. 2
c. 3
d. 5

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**Short Answer**

20.

$CH3NH2(aq) + H2O(l) \Leftrightarrow CH3NH3^{+}(aq) + OH^{-}.(aq)$ $Kb = 4.4\ E{-}4$

1. Methylamine, CH3NH2 , is a weak base that reacts with water according to the equation above. A student obtains a .2M sample with a volume of 50.0 mL

(a) Write the expression for the equilibrium constant, *Kb* , for methylamine.

(b)Using the concentration and the K value determine the concentration of $OH^-$ ions?

(c) Calculate the pOH and pH of the solution. (using the Kb)

The 50.0 mL sample of the methylamine solution is titrated with an HCl solution of .20M concentration. The equivalence point of the titration is reached after a volume of 36.0 mL of the HCl solution is added.

(d) Using the axes provided, sketch the titration curve that results from the titration described above. On the graph, clearly label the equivalence point of the titration.

e) Determine the unknown concentration of the methylamine. (moles/liter)