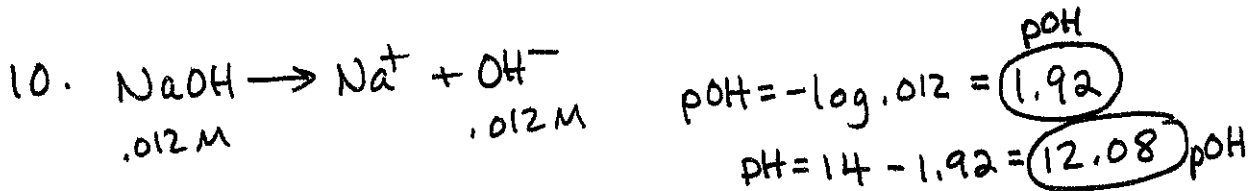
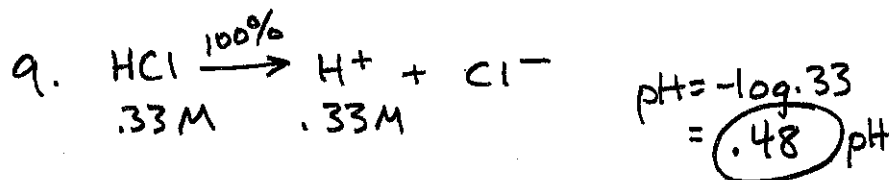
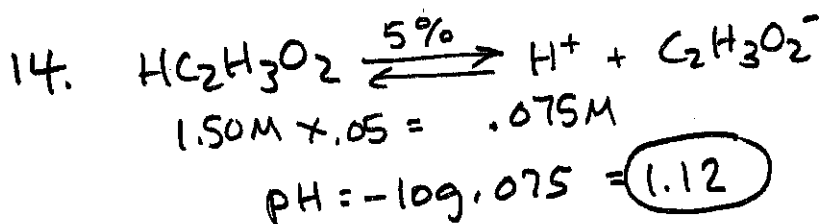
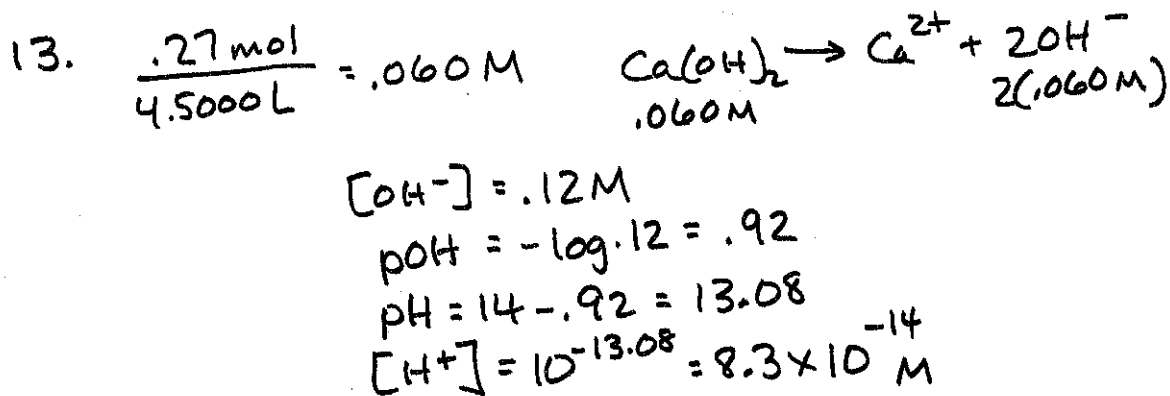
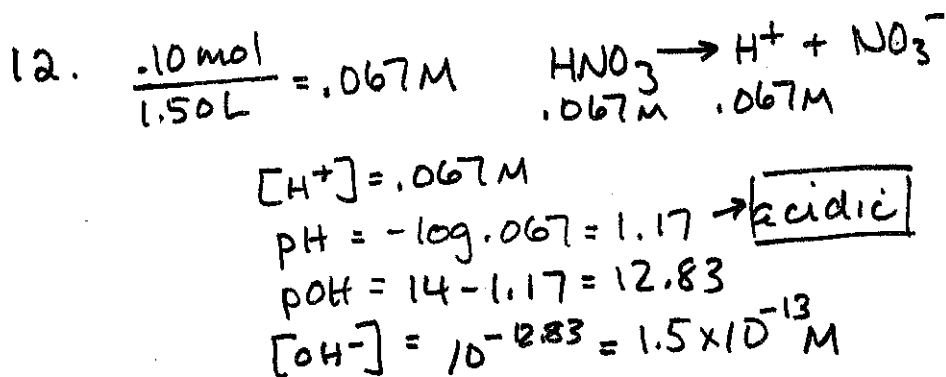
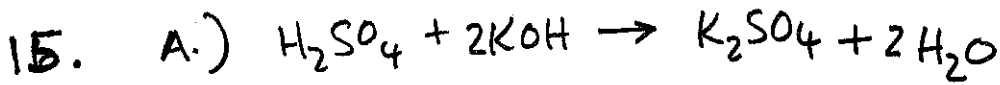


# Student Objectives - Practice Problems



11.  $\text{pH} = 5.10$   
 $\text{pOH} = 14 - 5.10 = 8.90$   
 $[\text{OH}^-] = 10^{-8.90} = 1.3 \times 10^{-9} \text{ M}$





$$(H^+)(M_a)(V_a) = (OH^-)(M_b)(V_b)$$

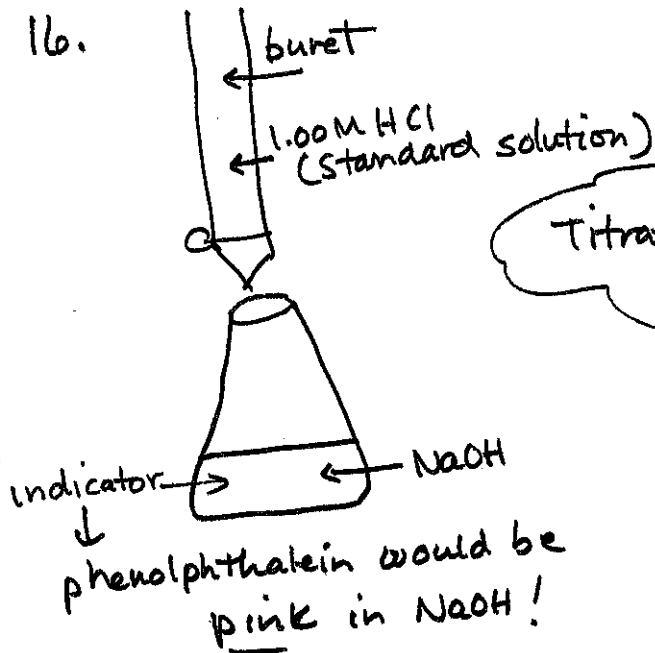
$$(2)(2.50 \times 10^{-2} M)(15.0 mL) = (1)(M_b)(10.0 mL)$$

$$M_b = .075 M KOH$$

B.)

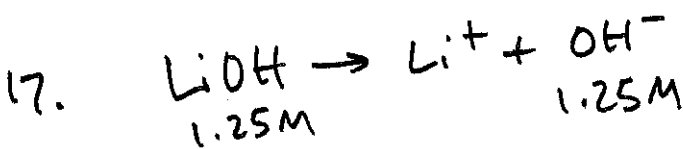
c.) sulfuric acid (Acid)  
potassium hydroxide (Base)  
potassium sulfate (Salt)

16.



Titrate until  $[H^+] = [OH^-]$   
equivalence point

- Record initial + final buret reading
- Calculate mL HCl used
- $M_a V_a = M_b V_b$  to solve for  $M_b$



$$pOH = -\log 1.25 = -.0969$$

$$pH = 14.0967$$

18. A.)  $[H^+] = 4.7 \times 10^{-7} M$

$$[OH^-] = \frac{1 \times 10^{-14}}{4.7 \times 10^{-7}} = 2.1 \times 10^{-8} M$$

$$pOH = -\log 2.1 \times 10^{-8} = 7.68 \Rightarrow pH = 14 - 7.68 = 6.32$$

B.) Acidic

C.) Red

19.  $[H_3O^+] = 3.8 \times 10^{-3} M$

$[OH^-] = \frac{1 \times 10^{-14}}{3.8 \times 10^{-3}} = 2.6 \times 10^{-12} M$



$(1)(.133M)(22.3mL) = (1)(.110M)(V_b)$

$V_b = 27.0mL$

use a grad cyl.

21.  $M_1 V_1 = M_2 V_2$

$(.800M)(300.0mL) = (.12M)(V_2)$

$V_2 = 20mL$

Measure 20 mL of stock solution & add enough dH<sub>2</sub>O to make a total of 300.0 mL of solution. (280 mL of dH<sub>2</sub>O)

22.  $.200M = \frac{X}{.5000L}$

$X = .100 \text{ moles NaCl}$

$\frac{.100 \text{ moles NaCl} / 58.44 \text{ g NaCl}}{1 \text{ mol NaCl}} = 5.844$

5.84 g NaCl

Put approx. 250 mL of dH<sub>2</sub>O in grad cyl. Add the NaCl and then dissolve. Fill grad. cyl. to 500 mL mark.