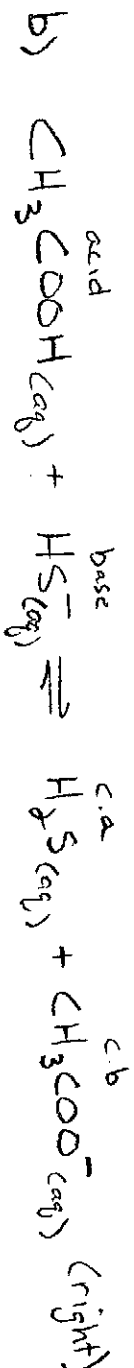
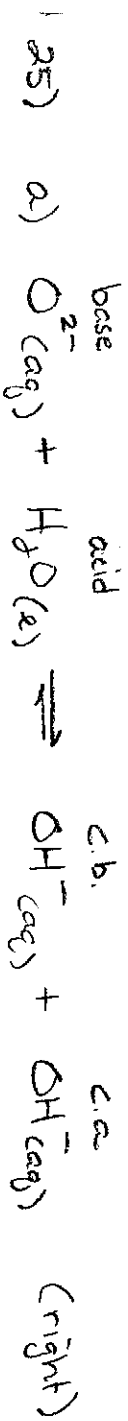
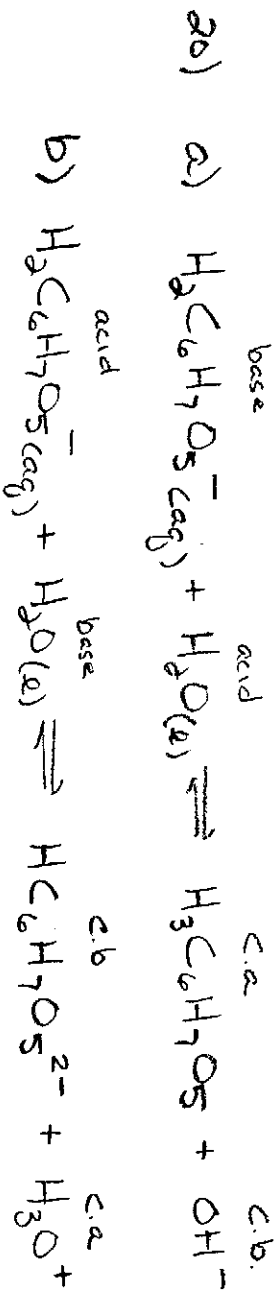
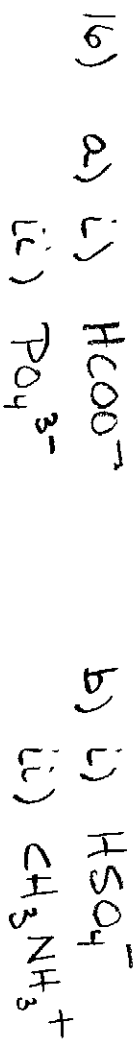


# Chapter 16: Homework Assignment # 48

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Chapter 16: Homework Set # 49  
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#2) a)  $\text{HY} \rightarrow$  more  $\text{H}^+$  ions present

b) if  $\text{HY}$  is a stronger acid, then  $\text{Y}^-$  is a weak base,  $\text{X}^-$  is a stronger base

c)  $\text{HY}$  is the stronger acid, equilibrium will lie to the left  $K_c < 1$

#29) a)  $[\text{OH}^-] = .00045 \text{ M}$

$$[\text{H}^+][\text{OH}^-] = 1.0 \times 10^{-14}$$

$$[\text{H}^+] = \frac{1.0 \times 10^{-14}}{.00045} = 2.2 \times 10^{-11} \text{ M} \quad (\text{basic})$$

b)  $[\text{OH}^-] = 8.8 \times 10^{-9} \text{ M}$

$$[\text{H}^+][\text{OH}^-] = 1.0 \times 10^{-14}$$

$$[\text{H}^+] = \frac{1.0 \times 10^{-14}}{8.8 \times 10^{-9}} = 1.1 \times 10^{-6} \text{ M} \quad (\text{acidic})$$

c)  $[\text{OH}^-] = 100[\text{H}^+]$

$$[\text{H}^+][\text{OH}^-] = [\text{H}^+](100[\text{H}^+]) = 1.0 \times 10^{-14}$$

$$[\text{H}^+] = \sqrt{\frac{1.0 \times 10^{-14}}{100}} = 1.0 \times 10^{-8} \text{ M}$$

(basic)

#33) a)  $\Delta \text{pH} = \text{pH}_2 - \text{pH}_1 = -(\log [\text{H}^+]_2 - \log [\text{H}^+]_1)$

$$= -\log \frac{[\text{H}^+]_2}{[\text{H}^+]_1}$$

#36) a)  $K_w = [H^+][OH^-]$

if  $HNO_3$  is added  $H_2O$ ,



$[OH^-]$  does not necessarily decrease

$[H^+]$  increases, pH decreases

b)  $[OH^-] = .014 M$

$$pOH = -\log .014 = 1.85$$

$$pH = 14 - pOH = 14.00 - 1.85 = 12.15 \quad (\text{basic})$$

c)  $pH = 6.6 = -\log [H^+]$

$$[H^+] = 10^{-6.6} = 2.5 \times 10^{-7} M$$

$$pOH = 14.00 - 6.6 = 7.4$$

$$[OH^-] = 10^{-7.4} = 4.0 \times 10^{-8} M$$

#38)	$[H^+]$	$[OH^-]$	pH	pOH	
	$7.5 \times 10^{-3}$	$1.3 \times 10^{-12}$	2.12	11.88	acidic
	$2.8 \times 10^{-5}$	$3.6 \times 10^{-10}$	4.56	9.44	acidic
	$5.6 \times 10^{-9}$	$1.8 \times 10^{-6}$	<u>8.25</u>	5.75	basic
	$5.0 \times 10^{-9}$	$2.0 \times 10^{-6}$	8.3	<u>5.70</u>	basic

#40)  $pH = -\log [H^+]$

$$5.2 = -\log [H^+]$$

$$[H^+] = 10^{-5.2} = 6 \times 10^{-6} M$$

$$pOH = 14.0 - 5.2 = 8.8$$

$$[OH^-] = 10^{-8.8}$$

$$= 2 \times 10^{-9} M$$

$$5.6 = -\log [H^+]$$

$$[H^+] = 10^{-5.6} = 3 \times 10^{-6} M$$

$$14.0 - 5.6 = 8.4$$

$$[OH^-] = 10^{-8.4}$$

$$= 4 \times 10^{-9} M$$