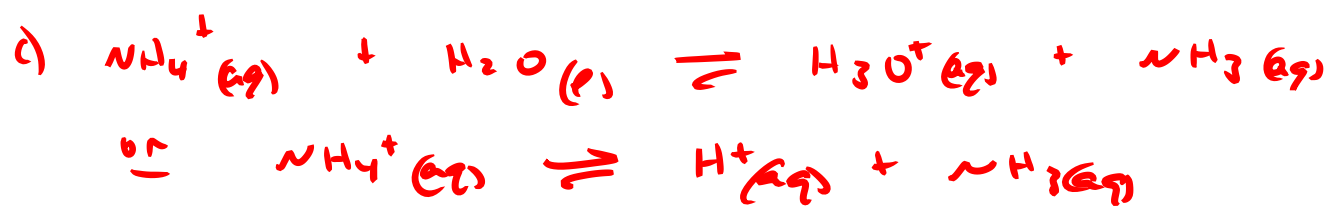
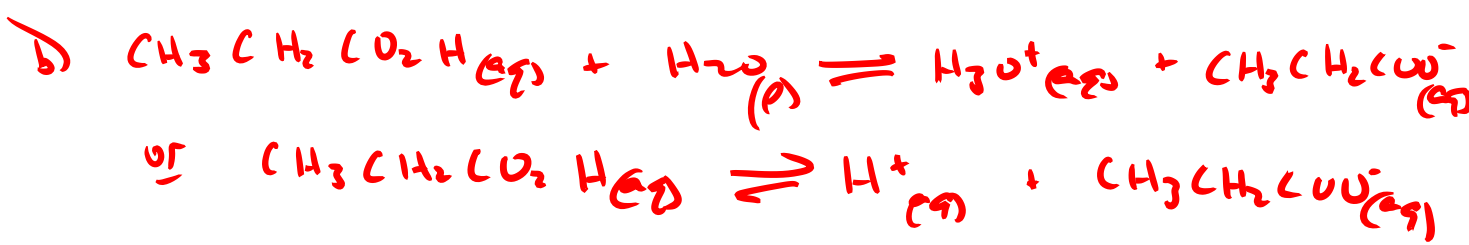
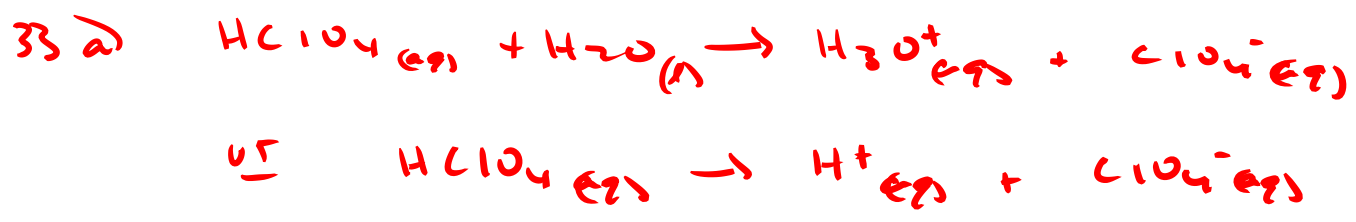


2) basic solutions: $[OH^-] > 1.0 \times 10^{-7} M$ $pOH < 7.00$
 $[H^+] < 1.0 \times 10^{-7} M$ $pH > 7.00$

basic solutions: b, c, d

23) # of decimal places in pH determines the number of sig figs in $[H^+]$
 - all three pH values, $[H^+]$ should be expressed with two sig figs because the pH has two decimal places



3a) $K_a \uparrow$ acid strength \uparrow



43) a) $[\text{OH}^-] = \frac{K_w}{[\text{H}^+]} = \frac{1.0 \times 10^{-14}}{1.0 \times 10^{-7}} = 1.0 \times 10^{-7} \text{ M}$
neutral

b) $[\text{OH}^-] = \frac{K_w}{[\text{H}^+]} = \frac{1.0 \times 10^{-14}}{8.3 \times 10^{-16}} = 12 \text{ M}$
basic

c) $[\text{OH}^-] = \frac{K_w}{[\text{H}^+]} = \frac{1.0 \times 10^{-14}}{12} = 8.3 \times 10^{-16} \text{ M}$
acidic

d) $[\text{OH}^-] = \frac{K_w}{[\text{H}^+]} = \frac{1.0 \times 10^{-14}}{5.4 \times 10^{-5}} = 1.9 \times 10^{-10} \text{ M}$
acidic

49 a) $pOH = 14.00 - 6.88 = 7.12$
 $[H^+] = 10^{-6.88} = 1.3 \times 10^{-7} M$
 $[OH^-] = 10^{-7.12} = 7.6 \times 10^{-8} M$ acidic

b) $[H^+] = \frac{1.0 \times 10^{-14}}{8.4 \times 10^{-14}} = 0.12 M$
 $pH = -\log(0.12) = 0.92$
 $pOH = 14.00 - 0.92 = 13.08$ acidic

c) $pH = 14.00 - 3.11 = 10.89$
 $[H^+] = 10^{-10.89} = 1.3 \times 10^{-11} M$
 $[OH^-] = 10^{-3.11} = 7.8 \times 10^{-4} M$ basic

d) $pH = -\log(1.0 \times 10^{-7}) = 7.00$
 $pOH = 14.00 - 7.00 = 7.00$
 $[OH^-] = 10^{-7.00} = 1.0 \times 10^{-7} M$ neutral