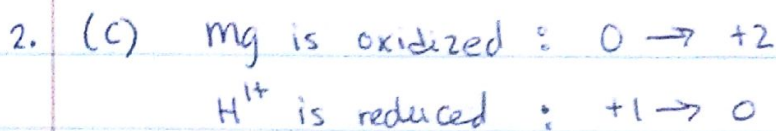
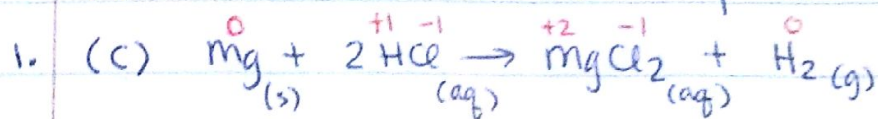


Chapter 4

AP MC Review Questions - p. 188A + B



3. (B)
$$200. \text{ mL MgCl}_2 \times \frac{0.60 \text{ mol MgCl}_2}{1000 \text{ mL}} = 0.12 \text{ mol MgCl}_2$$

$$[\text{Mg}^{2+}] = \frac{0.12 \text{ mol Mg}^{2+}}{.200 \text{ L} + .400 \text{ L}} = \boxed{.20 \text{ M Mg}^{2+}}$$

$$[\text{Cl}^-] = \frac{0.24 \text{ mol Cl}^-}{.200 \text{ L} + .400 \text{ L}} = \boxed{0.40 \text{ M Cl}^-}$$

4. (C)
$$20.0 \text{ mL HCl} \times \frac{12.0 \text{ mol HCl}}{1000 \text{ mL}} = 0.240 \text{ mol HCl}$$

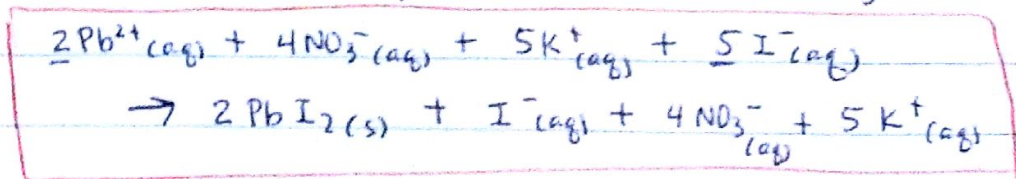
$$\frac{0.240 \text{ mol HCl}}{.0200 \text{ L} + x} = \frac{0.500 \text{ mol HCl}}{1 \text{ L}}$$

$$.240 = .0100 + .500x$$

$$x = .460 \text{ L}$$

$$= \boxed{460. \text{ mL}}$$

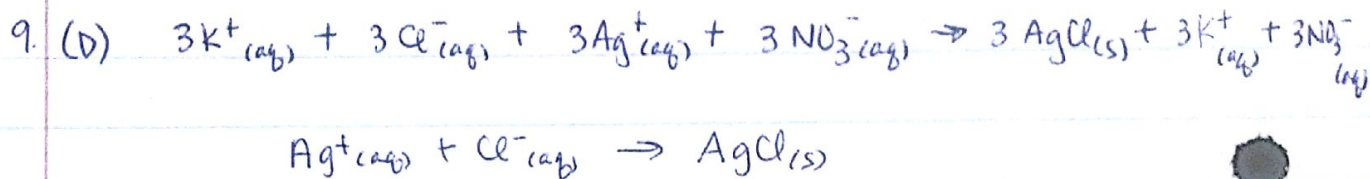
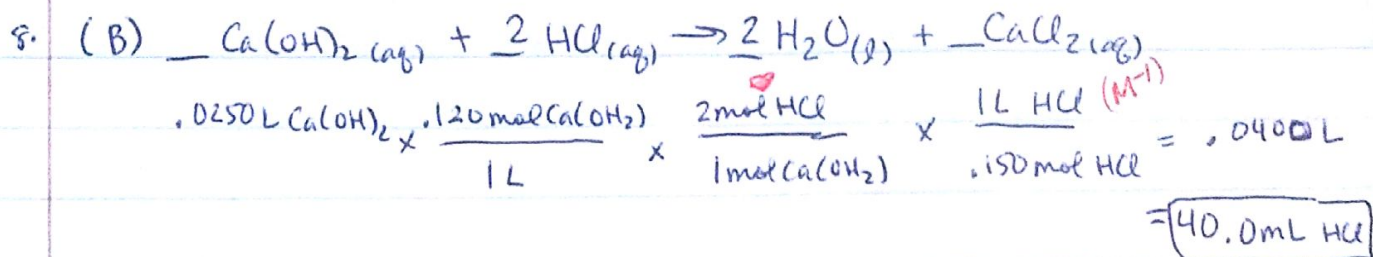
5. (D) PbI_2 is a precipitate, K^+ and NO_3^- are in solution.



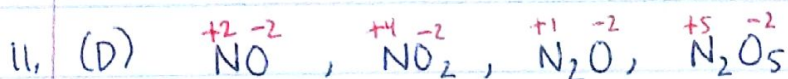
6. (A) K^+ and NO_3^- are exclusively spectator ions.

7. (B) $20. \text{ mL KMnO}_4 \times \frac{.20 \text{ mol KMnO}_4}{1000 \text{ mL}} \times \frac{1 \text{ mol MnO}_4^-}{1 \text{ mol KMnO}_4} \times \frac{3 \text{ mol ClO}_2^-}{4 \text{ mol MnO}_4^-} = .0030 \text{ mol ClO}_2^-$ Stoich.

$$M_{\text{ClO}_2^-} = \frac{0.0030 \text{ mol}}{.015 \text{ L}} = \boxed{0.20 \text{ M}}$$



10. (A) K^+ and NO_3^- are spectators

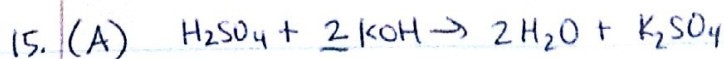


12. (A) NaCl is a strong electrolyte because it completely ionizes

13. (B) $M_1V_1 = M_2V_2$
 $(100.0 \text{ mL})(1.00 \text{ M}) = (1.33 \text{ M})V_2$
 $V_2 = 75.2 \text{ mL}$ $\therefore \sim 25.0 \text{ mL evaporated}$

14. (C) $(.2000 \text{ L})(1.00 \frac{\text{mol NaCl}}{\text{L}}) = .200 \text{ mol NaCl}$
 $(.3000 \text{ L})(1.00 \frac{\text{mol MgCl}_2}{\text{L}}) = .300 \text{ mol MgCl}_2$

$$[\text{Cl}^-] = \frac{(.200 + .600) \text{ mol}}{(.2000 + .3000) \text{ L}} = \boxed{1.6 \text{ M}}$$



$$.8000 \text{ L KOH} \times \frac{.100 \text{ mol KOH}}{1 \text{ L}} \times \frac{1 \text{ mol H}_2\text{SO}_4}{2 \text{ mol KOH}} \times \frac{1000 \text{ mL}}{.2000 \text{ mol H}_2\text{SO}_4} = \frac{2000.0}{.2000} = \boxed{200.0 \text{ mL}}$$