

Chemistry II - Molarity (KEY)

1. a) $M = \frac{0.87 \text{ mol MgCl}_2}{3.0 \text{ L}} = \boxed{0.29 \text{ M}}$ b) $M = \frac{1.6 \text{ mol Co(OH)}_2}{0.200 \text{ L}} = \boxed{8.0 \text{ M}}$

c) $M = \frac{8.4 \text{ mol NaCl}}{2.100 \text{ L}} = \boxed{4.0 \text{ M}}$ d) $M = \frac{425 \text{ g NaNO}_3}{2.0 \text{ L}} \left| \frac{1 \text{ mol}}{85.0 \text{ g}} \right| = \boxed{2.5 \text{ M}}$

e) $\frac{17.0 \text{ g AgCl}}{143.4 \text{ g}} \left| \frac{1 \text{ mol}}{143.4 \text{ g}} \right| = \frac{0.1185 \text{ mol AgCl}}{0.500 \text{ L}} = \boxed{0.237 \text{ M}}$

f) $\frac{5.0 \text{ g NaOH}}{40.0 \text{ g}} \left| \frac{1 \text{ mol}}{40.0 \text{ g}} \right| = \frac{0.125 \text{ mol NaOH}}{0.060 \text{ L}} = \boxed{2.08 \text{ M}}$

2a) $\text{mol} = (0.50 \text{ M})(1.0 \text{ L}) = \frac{0.50 \text{ mol}}{1 \text{ mol}} \left| \frac{149.9 \text{ g NaI}}{1 \text{ mol}} \right| = \boxed{75 \text{ g NaI}}$

b) $\text{mol} = (3.0 \text{ M})(4.0 \text{ L}) = \frac{12.0 \text{ mol}}{1 \text{ mol}} \left| \frac{142.1 \text{ g Na}_2\text{SO}_4}{1 \text{ mol}} \right| = \boxed{1.7 \times 10^3 \text{ g Na}_2\text{SO}_4}$

c) $\text{mol} = (7.00 \text{ M})(0.0250 \text{ L}) = \frac{0.175 \text{ mol}}{1 \text{ mol}} \left| \frac{331.2 \text{ g Pb(NO}_3)_2}{1 \text{ mol}} \right| = \boxed{58.0 \text{ g Pb(NO}_3)_2}$

d) $\text{mol} = (0.20 \text{ M})(1.500 \text{ L}) = \frac{0.30 \text{ mol}}{1 \text{ mol}} \left| \frac{212.3 \text{ g K}_3\text{PO}_4}{1 \text{ mol}} \right| = \boxed{64 \text{ g K}_3\text{PO}_4}$

3. $\frac{14.6 \text{ g NaOH}}{40.0 \text{ g NaOH}} \left| \frac{1 \text{ mol}}{40.0 \text{ g}} \right| = 0.365 \text{ mol NaOH}$ $M = \frac{0.365 \text{ mol}}{0.600 \text{ L}} = \boxed{0.608 \text{ M}}$

4. $M = \frac{0.653 \text{ mol BaI}_2}{1.23 \text{ L}} = \boxed{0.531 \text{ M}}$

8. $\text{mol} = (1.30 \times 10^{-3} \text{ M})(0.0550 \text{ L}) = \boxed{7.15 \times 10^{-5} \text{ mol SrI}_2}$

5. $\text{mol} = (0.400 \text{ M})(0.0425 \text{ L}) = \boxed{0.0170 \text{ mol CaCO}_3}$

6. $\text{mol} = (0.100 \text{ M})(0.250 \text{ L}) = 0.025 \text{ mol AgNO}_3$

$\frac{0.025 \text{ mol AgNO}_3}{1 \text{ mol}} \left| \frac{169.9 \text{ g AgNO}_3}{1 \text{ mol}} \right| = \boxed{4.2 \text{ g AgNO}_3}$

7. $\frac{12.5 \text{ g NaCl}}{58.5 \text{ g NaCl}} \left| \frac{1 \text{ mol NaCl}}{58.5 \text{ g NaCl}} \right| = 0.2137 \text{ mol NaCl}$

$V = \frac{0.2137 \text{ mol}}{1.20 \text{ M}} = \boxed{0.178 \text{ L}}$