

9. a.

$$0.0500 \text{ L} \times \frac{1.25 \text{ mol HCl}}{1 \text{ L}} \times \frac{1 \text{ mol H}_2\text{O}}{1 \text{ mol HCl}} \times \frac{18.0 \text{ g H}_2\text{O}}{1 \text{ mol H}_2\text{O}} = \boxed{1.13 \text{ g H}_2\text{O}}$$

b. HCl is the limiting Reactant.

c.

used

omit!

10. a.

$$71.0 \text{ g ClO}_2 \times \frac{1 \text{ mol ClO}_2}{67.5 \text{ g}} \times \frac{1 \text{ mol HCl}}{6 \text{ mol ClO}_2} \times \frac{36.5 \text{ g}}{1 \text{ mol HCl}} = \boxed{6.40 \text{ g HCl}}$$

b.

The limiting Reactant is ClO_2 .

c.

$$71.0 \text{ g ClO}_2 \times \frac{1 \text{ mol ClO}_2}{67.5 \text{ g}} \times \frac{3 \text{ mol H}_2\text{O}}{6 \text{ mol ClO}_2} \times \frac{18.0 \text{ g}}{1 \text{ mol H}_2\text{O}} = 9.47 \text{ g H}_2\text{O}$$

IF = 126.9
SF = 95.0

$$19.0 \text{ g} - 9.47 \Rightarrow \boxed{9.5 \text{ g H}_2\text{O left}}$$

11. (a) $1.23 \text{ g MnI}_2 \times \frac{1 \text{ mol MnI}_2}{308.7 \text{ g}} \times \frac{4 \text{ mol IF}_5}{2 \text{ mol MnI}_2} \times \frac{221.9 \text{ g}}{1 \text{ mol IF}_5} = \boxed{1.77 \text{ g IF}_5}$

(b) The limiting reactant is MnI_2 .

(c)

$$1.23 \text{ g MnI}_2 \times \frac{1 \text{ mol MnI}_2}{308.7 \text{ g}} \times \frac{13 \text{ mol F}_2}{2 \text{ mol MnI}_2} \times \frac{38.0 \text{ g}}{1 \text{ mol F}_2} = 0.984 \text{ g F}_2.$$

$$\therefore 25.0 \text{ g} - 0.984 \text{ g} = \boxed{24.0 \text{ g F}_2 \text{ remains}}$$