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 liminting Reactant is ClO_2.

(c)

$$71.0 \text{ g } ClO_2 \times \frac{1 \text{ mol } ClO_2}{67.5 \text{ g}} \times \frac{3 \text{ mol } H_2O}{6 \text{ mol } ClO_2} \times \frac{18.0 \text{ g}}{1 \text{ mol } H_2O} = 9.47 \text{ g } H_2O$$

$1 \text{ I} = 126.9$
$5 \text{ F} = \underline{95.0}$ ∴ $19.0 \text{ g} - 9.47 \Rightarrow \boxed{9.5 \text{ g } H_2O \text{ left}}$

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)

$1.23 \text{ g } MnI_2 \times \frac{1 \text{ mol } MnI_2}{308.7 \text{ g}} \times \frac{13 \text{ mol } F_2}{2 \text{ mol } MnI_2} \times \frac{38.0 \text{ g}}{1 \text{ mol } F_2} = 0.984 \text{ g } F_2$.

∴ $25.0 \text{ g} - 0.984 \text{ g} = \boxed{24.0 \text{ g } F_2 \text{ remains}}$

9. a.

$$0.0500\,L \times \frac{1.25\,mol\,HCl}{1L} \times \frac{1\,mol\,H_2O}{1\,mol\,HCl} \times \frac{18.0g\,H_2O}{1\,mol\,H_2O} = \boxed{1.13\,g\,H_2O}$$

b. HCl is the limiting Reactant.

c.

used

$$0.0500\,L \times \frac{1.250\,mol\,HCl}{1L} \times \frac{1\,mol\,KOH}{1\,mol\,HCl} = \boxed{0.0625\,mol}$$

Have:

$$0.0750\,L \times \frac{1.00\,mol\,KOH}{1L} = 0.0750\,mol - 0.0625\,mol$$

$$= \boxed{0.0125\,mol\,KOH}$$