(5 mol) (4 mol) (10 mol)

$$2SO_2 + O_2 + H_2O \rightarrow 2H_2SO_4$$

① Theoretical yield of each

$$5\ \text{mol}\ SO_2 \times \frac{2\ \text{mol}\ H_2SO_4}{2\ \text{mol}\ SO_2} = 5\ \text{mol}\ H_2SO_4$$

→ SO_2 is L.R.

$$4\ \text{mol}\ O_2 \times \frac{2\ \text{mol}\ H_2SO_4}{1\ \text{mol}\ O_2} = 8\ \text{mol}\ H_2SO_4$$

$$10\ \text{mol}\ H_2O \times \frac{2\ \text{mol}\ H_2SO_4}{1\ \text{mol}\ H_2O} = 20\ \text{mol}\ H_2SO_4$$

② Divide molar amt. by its stoich. factor (coeff.)

$$\frac{5\ \text{mol}\ SO_2}{2\ \text{mol}\ SO_2} = 2.5$$

→ SO_2 is L.R.

$$\frac{4\ \text{mol}\ O_2}{1\ \text{mol}\ O_2} = 4$$

$$\frac{10\ \text{mol}\ H_2O}{1\ \text{mol}\ H_2O} = 10$$