Stoichiometry Practice

Indicate the state: gas, liquid, solid, aqueous of each substance.

1) What mass of sulphur trioxide is formed from 96 g of sulphur dioxide?

$$2\,SO_2 + O_2 \rightarrow 2\,SO_3$$

2) What mass of potassium oxide is formed when 9.75 g of potassium is burned in oxygen?

$$4\,K + O_2 \rightarrow 2\,K_2O$$

3) What mass of hydrogen is formed when 0.2 g of calcium reacts with hydrochloric acid?

$$Ca + 2\,HCl \rightarrow CaCl_2 + H_2$$

4) What mass of sodium is needed to reduce 1 kg of titanium chloride?

$$TiCl_4 + 4\,Na \rightarrow Ti + 4\,NaCl$$

5) What mass of carbon monoxide is needed to reduce 1 kg of iron oxide to iron?

$$Fe_2O_3 + 3\,CO \rightarrow 2\,Fe + 3\,CO_2$$

6) What mass of oxygen is needed to burn 110 g of propane (C_3H_8)?

$$C_3H_8 + 5\,O_2 \rightarrow 3\,CO_2 + 4\,H_2O$$

7) What mass of iron reacts with 14.2 g of chlorine?

$$2\,Fe + 3\,Cl_2 \rightarrow 2\,FeCl_3$$

8) 4.17 g of hydrated barium bromide crystals ($BaBr_2.nH_2O$) gave 3.72 g of anhydrous barium bromide on heating to constant mass. Work out the relative molecular mass (M_r) of the hydrated barium bromide and the value of *n*.

$$BaBr_2.nH_2O \rightarrow BaBr_2 + n\,H_2O$$