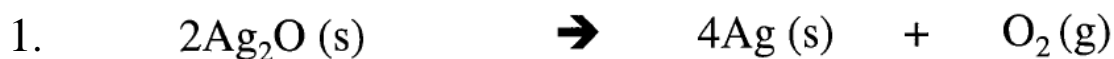


Higher Chemistry Calculations for the Prelim



Calculate the volume of oxygen that is produced when 46.36 g of silver oxide completely decomposes.

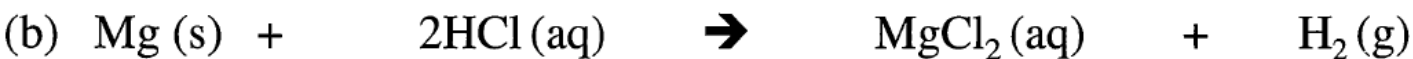


Calculate the volume of hydrogen gas that is produced when 6.54 g of zinc is added to excess dilute hydrochloric acid.

3. Calculate which reactant is in excess and therefore identify the limiting reactant in the following.



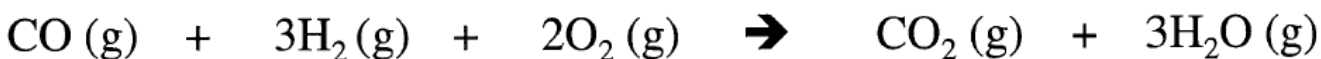
6.54 g of zinc added to 25 cm³ of dilute sulphuric acid, concentration 2 mol l⁻¹.



2.43 g of magnesium added to 100 cm³ of dilute hydrochloric acid, concentration 1 mol l⁻¹.

4.

Gas syringes are graduated to allow the volume of gases to be measured. A heated box kept a syringe at a temperature greater than 100 °C. The syringe contained 150 cm³ of hydrogen and 50 cm³ of carbon monoxide mixed with 200 cm³ of oxygen. When ignited the gases reacted as shown.



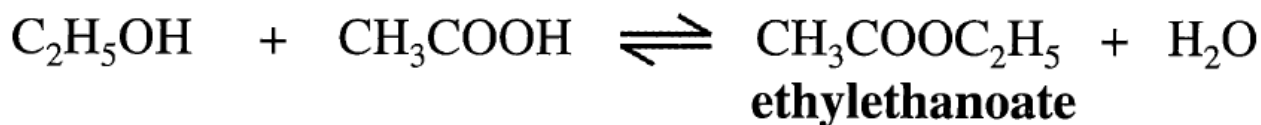
- Name the reactant gas which was in excess and give the remaining volume of this gas.
- What was the volume and composition of the products of the reaction?
- What would have been the reading on the gas syringe if, at the end of the reaction, the gases had been allowed to cool to room temperature?

5. Calculate the percentage yield of 1,2-dibromopropane.



In a preparation, 20.4 g of 1,2-dibromopropane is obtained from 5.2 g of propene.

6. Calculate the mass of ester produced in the following reaction.



The percentage yield from 4.6 g of ethanol is 81%.

7. Calculate the enthalpy of combustion using the following information.

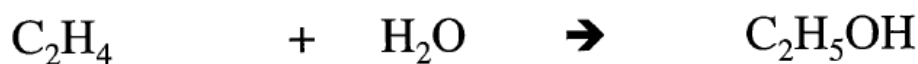
(a) The temperature of 50 cm³ of water is increased by 15 °C.

(b) The temperature of 100 cm³ of water is increased by 23.6 °C.

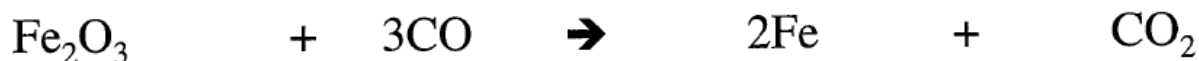
In part (a), 0.24 g of ethanol was burned. In part (b), 0.18 g of propanol was burned.

8. Calculate the atom economy for each of the following reactions.

(a) Making ethanol from ethene



(b) Making iron from iron(III) oxide



(c) Making calcium oxide from calcium carbonate

