

C5.1.1 Part 1 – Limiting Reactants

Links to previous knowledge

- Interpreting chemical formulae
- Balancing equations
- Conservation of mass
- What is a mole?




Learning Objectives

- State what a limiting reactant is
- Identify a limiting reactant
- Use limiting reactants to work out how much product will be made

In any reaction, the **limiting reactant** is the one that gets used up and stops the reaction from proceeding further.

The other reactant is **in excess**.

Model for a limiting reactant

1 cheese	1 slice of bread	→	1 slice of cheese on toast
			


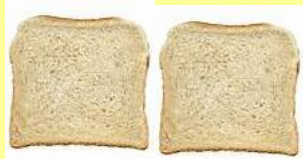

What is the limiting reactant?

(The one that limits how many products are made)

3 slices of cheese and 4 slices of bread = **3 slices of cheese on toast**

6 slices of cheese and 4 slices of bread = **4 slices of cheese on toast**

Model for a limiting reactant

1 cheese	2 slices of bread		1 cheese sandwich
		→	

What is the limiting reactant?



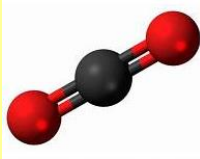
(The one that limits how many products are made)

3 slices of cheese and 4 slices of bread = **2 cheese sandwiches**

6 slices of cheese and 6 slices of bread = **3 cheese sandwiches**

Real example of limiting reactants



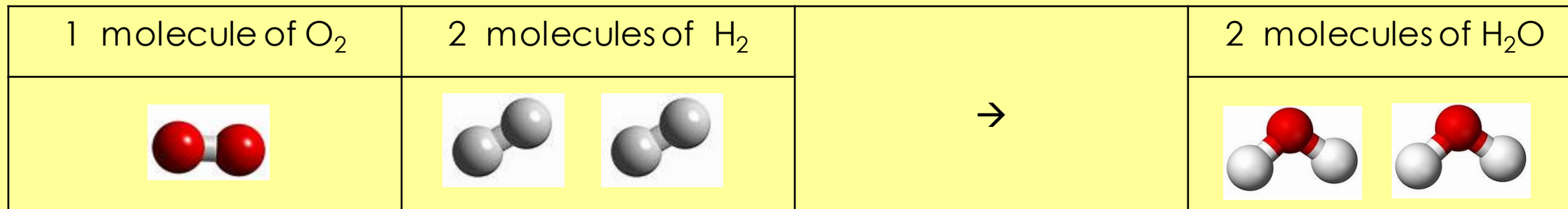
1 atom of C	1 molecule of O ₂		1 molecule of CO ₂
		→	

3 atoms of carbon and 4 molecules of oxygen
= 3 molecules of carbon dioxide

6 atoms of carbon and 4 molecules of oxygen
= 4 molecules of oxygen

- Work out the ratio in the equation
- Circle the limiting reactant
- Use the limiting reactant to work out how much product is made

Real example of limiting reactants

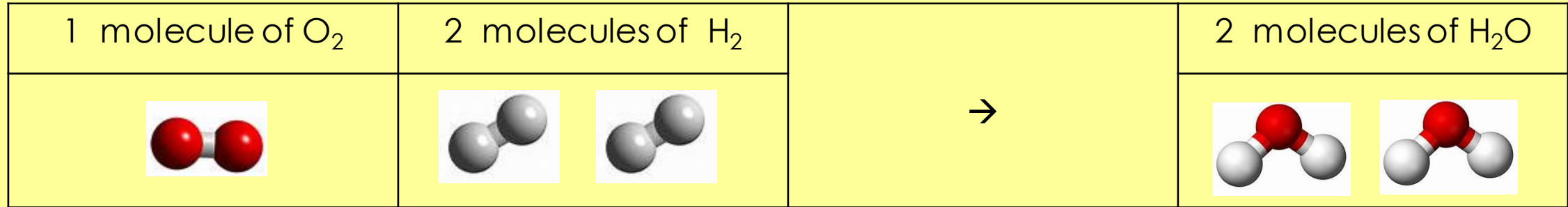


3 molecules of oxygen and 4 molecules of hydrogen
= 4 molecules of water

4 molecules of oxygen and 6 molecules of hydrogen
= 6 molecules of water

- Work out the ratio in the equation
- Circle the limiting reactant
- Use the limiting reactant to work out how much product is made

Real example of limiting reactants



3 molecules of oxygen and 4 molecules of hydrogen
= 4 molecules of water

4 molecules of oxygen and 6 molecules of hydrogen
= 6 molecules of water

- Work out the ratio in the equation
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TASK 1: Exam question

Magnesium is the limiting reactant in this reaction.

What is meant by limiting reactant?

[1]

TASK 1: Exam question

(Answer on next slide)

Magnesium is the limiting reactant in this reaction.

What is meant by limiting reactant?

[1]

reactant not in excess / that is all used up (at the end of the reaction) (1)

TASK 2: Complete the questions on the worksheet

Extension worksheet available

Remember

- Work out the ratio in the equation
- Circle the limiting reactant
- Use the limiting reactant to work out how much product is made

Answer the quiz questions