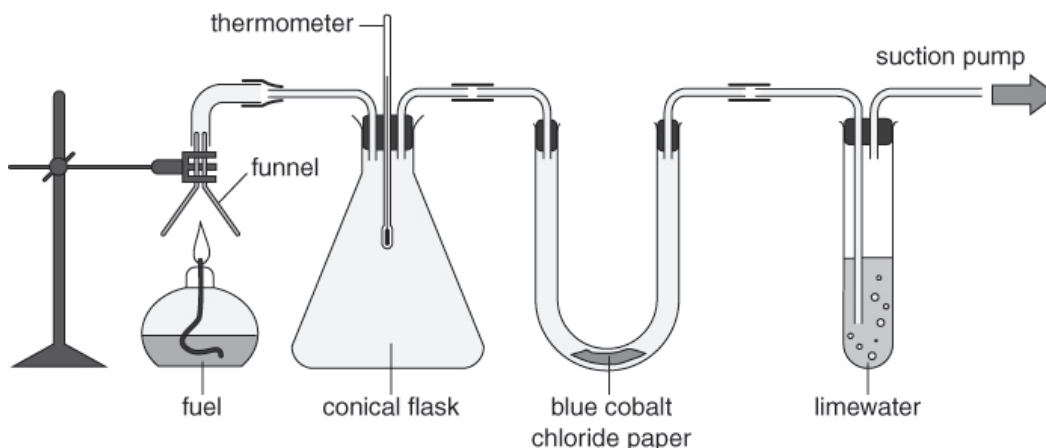


Name _____ Class _____ Date _____

- 1 The apparatus shown below is used to show what happens during the combustion of a hydrocarbon fuel.



(a) Why will the thermometer reading change during the experiment? Tick **one** box.

- ☐ A The temperature decreases because energy is absorbed by the fuel.
- ☐ B The temperature increases because energy is transferred from the fuel to the surroundings.
- ☐ C The temperature decreases because energy is transferred from the thermometer to the surroundings.
- ☐ D The temperature increases because energy is transferred from the surroundings to the fuel.

(1)

(b) What will happen to the limewater during the experiment? Tick **one** box.

- ☐ A The limewater will turn cloudy because it reacts with oxygen produced in the reaction.
- ☐ B The limewater will turn dark because it reacts with heat produced in the reaction.
- ☐ C The limewater will turn cloudy because it reacts with carbon dioxide produced in the reaction.
- ☐ D The limewater will turn pink because it reacts with carbon dioxide produced in the reaction.

(1)

- (c) Give a reason why anhydrous copper sulfate could replace the cobalt chloride paper in the experiment.

(1)

- (d) During the experiment a black powder can form on the funnel above the candle.
Name this black powder and give a reason why the powder forms.

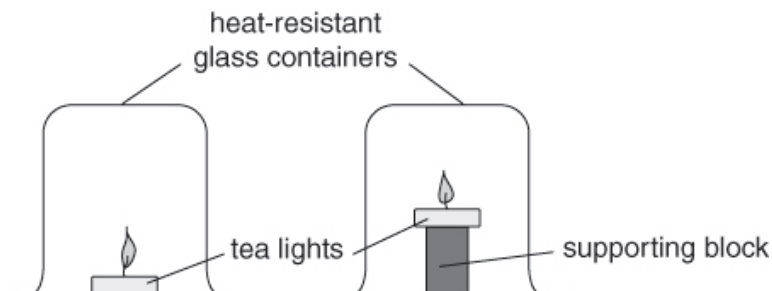
(2)

- (e) Blue copper sulfate can be converted to anhydrous copper sulfate by thermal decomposition. Explain what thermal decomposition means.

(2)

(Total for Question 1 = 7 marks)

- 2 A tea light is a type of candle. The diagram shows apparatus used to investigate the effect of the height of a candle on the time taken before the candle goes out.



- (a) Candle wax is a hydrocarbon. Write a word equation for the complete combustion of candle wax.

(2)

- (b) Give **one** reason why the candle flame goes out.

(1)

(c) Describe how **two** control variables might affect the experiment and describe how each variable could be controlled.

(i) Control variable and effect: _____

(1)

How this variable could be controlled: _____

(1)

(ii) Control variable and effect: _____

(1)

How this variable could be controlled: _____

(1)

(Total for Question 2 = 7 marks)

3 When 4.9g of magnesium is burnt in air, 8.1 g of product is formed.

(a) What is the name of the product formed? Tick **one** box.

- ☐ **A** magnesium oxide
- ☐ **B** magnesium dioxide
- ☐ **C** carbon dioxide
- ☐ **D** magnesium chloride

(1)

(b) Explain the increase in mass.

(2)

(Total for Question 3 = 3 marks)

4 Sulfur dioxide is a pollutant gas in air.

(a) Describe how sulfur dioxide is produced from the combustion of fossil fuels.

(1)

(b) Explain how sulfur dioxide in air can pollute the environment.

(2)

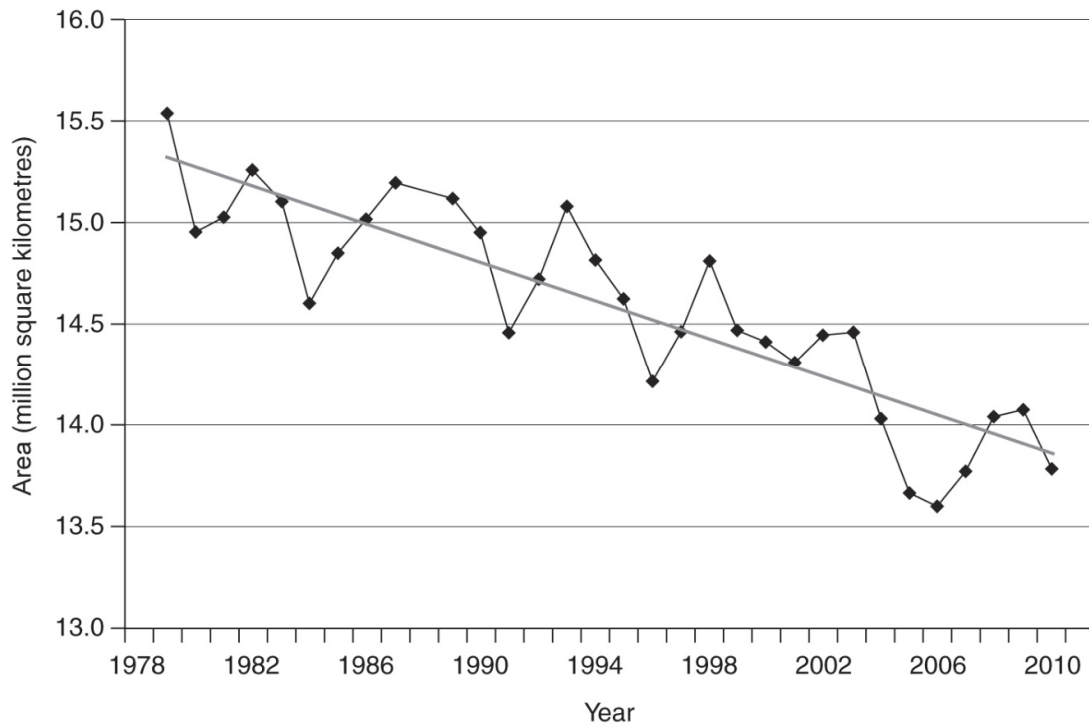
(Total for Question 4 = 3 marks)

5 Many vehicles are fitted with a catalytic converter so that exhaust gases pass through the converter before being released into the air.

Explain the function of the catalyst in a converter.

(Total for Question 5 = 2 marks)

- 6 The graph shows the average area of Arctic sea ice in January, from 1979 to 2010.



- (a) Describe the trend shown in the graph.

(1)

- (b) Explain how this change can be linked to human activity.

(2)

(Total for Question 6 = 3 marks)