

Chemistry

Section I – Part B (continued)

Marks

Question 25 (6 marks)

Explain the need for monitoring the products of a chemical reaction such as combustion.

6

It certain reactions different products can form depending on the amount of reactants. For example, complete combustion will result in water and CO_2 carbon dioxide being produced, normal atmospheric compounds.



however if incomplete combustion occurs i.e. insufficient oxygen harmful pollutants like carbon monoxide may form.



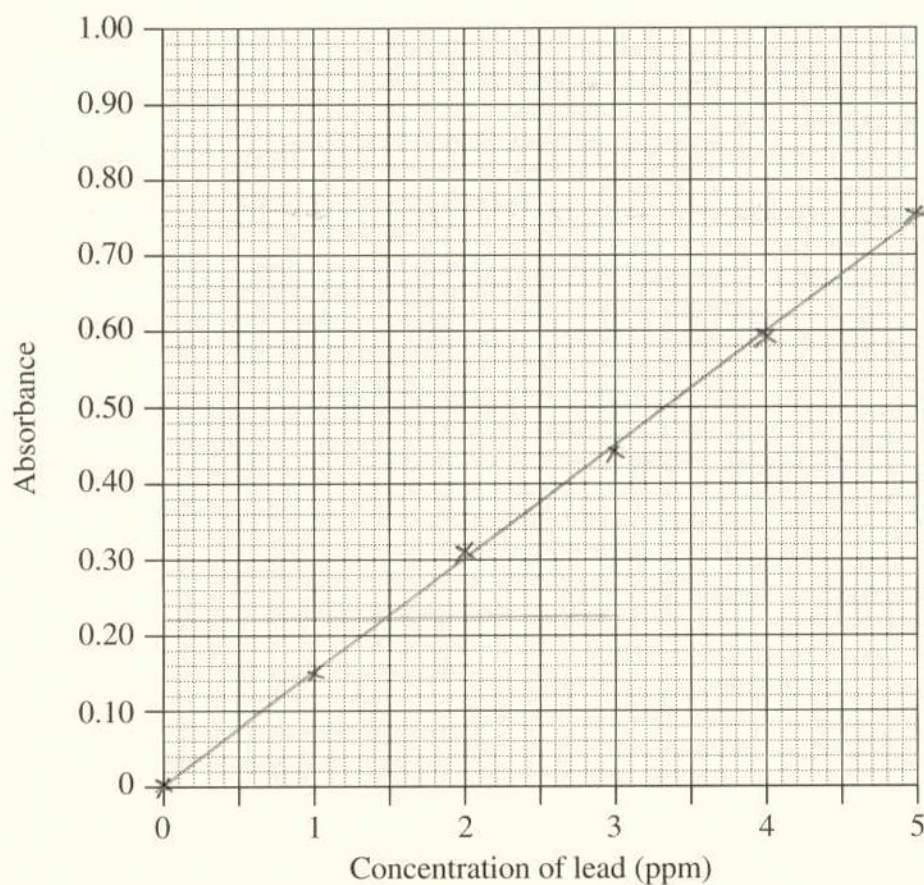
Therefore it is vital to monitor the reactants and products of reaction to see they are at optimal levels.

Question 26 (4 marks)

A university student decided to measure the concentration of lead (Pb) in the soil around his home. He prepared five standard lead solutions of known concentration. The absorbance of these solutions was measured. These results are shown in the table.

<i>Concentration of lead standard (ppm)</i>	<i>Absorbance</i>
0	0.00
1	0.15
2	0.31
3	0.44
4	0.59
5	0.75

(a) Draw a line graph of these data.

1

Question 26 continues on page 23

Question 26 (continued)

- (b) The student prepared solutions from four different soil samples around his home. These solutions were also analysed using the same method. The results are shown in the table. 1

<i>Solutions made from soil samples</i>	
<i>Area sampled</i>	<i>Absorbance</i>
Front garden bed	0.19
Back garden bed	0.09
Mail box	0.22
Back fence	0.11

Determine the highest concentration of lead in the soil around the home.

..... mail box - lead \approx 1.5 ppm

- (c) State an hypothesis to account for the variation in lead concentration around the student's home. 2

..... The variations in lead
 concentration are due to
 the amount of traffic near
 by.

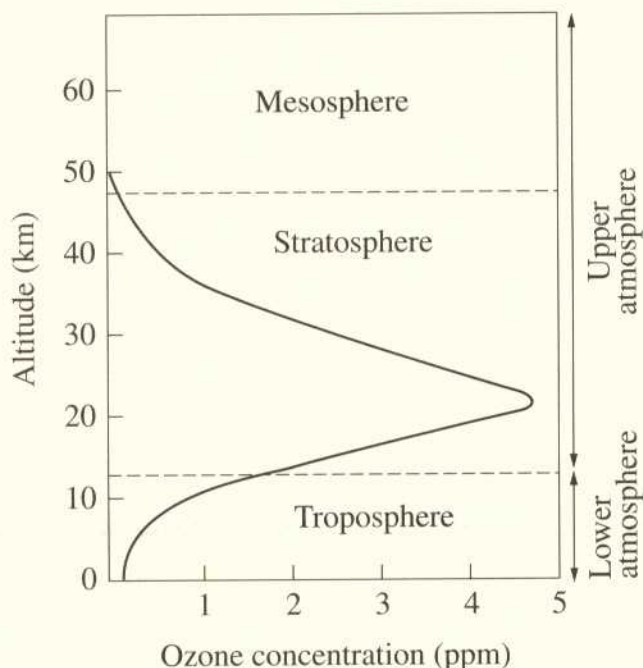
End of Question 26

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Question 27 (4 marks)

Oxygen exists in the atmosphere as the allotropes oxygen and ozone. The graph shows a typical change in ozone concentration with changing altitude.

4



Compare the environmental effects of the presence of ozone in the upper and lower atmosphere.

Ozone in the upper atmosphere is essential for the survival of all living organisms as it blocks out harmful UV-C and UV-B. If these rays were allowed to pass through the atmosphere they could cause skin cancer in humans and mutations in plants. Ozone in the lower atmosphere is hazardous to human life as it can cause respiratory problems and is produced by photochemical smog.