

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

Chemical reactions such as combustion need to be monitored to ensure that the desired product is produced, as different products can form at different temperatures.

Combustion reactions also need to be monitored because some of the products may be harmful to the environment, such as oxides of sulfur and nitrogen.

The products also need to be monitored to ensure they contain the right components and amounts of impurities, and that the amounts of impurities do not exceed set standards.

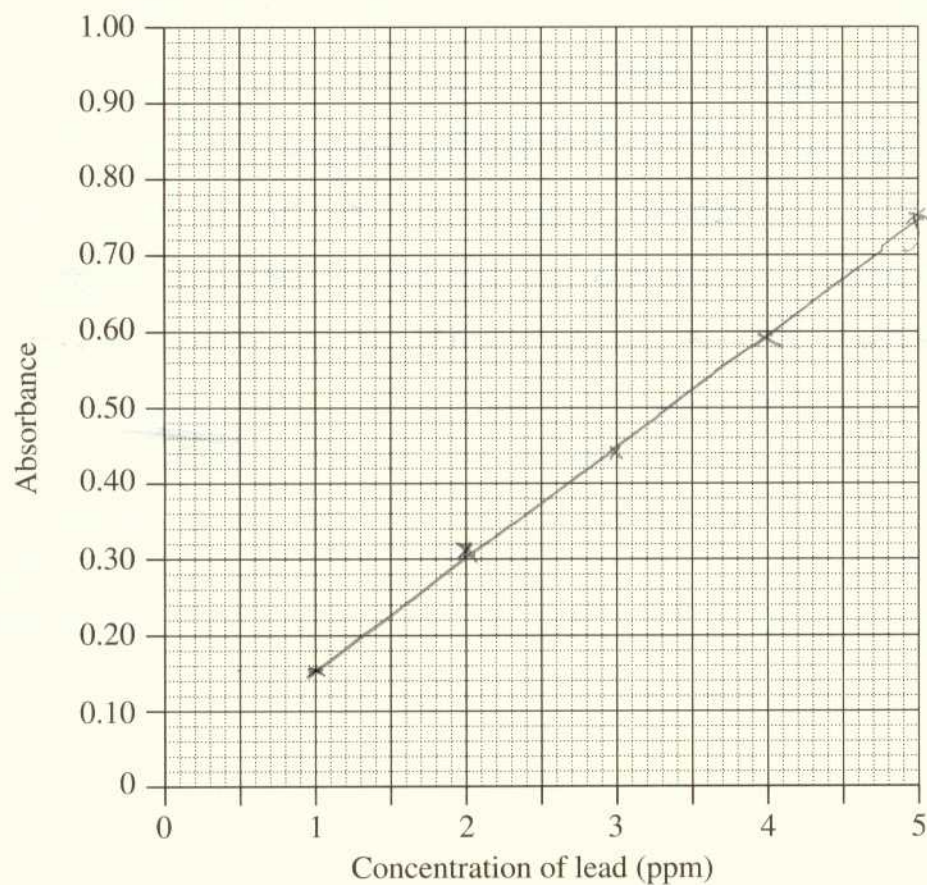
Question 26 (4 marks)

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.

In the mailbox at approx 1.5 ppm

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

2

*Due to the different things in these places
 For example the Mail box may be contain lead
 and hence ^{put} lead ~~to~~ into the soil etc
 fence may ~~be~~ ~~also~~ whereas the back garden
 bed does not lead components near it so has
 not so much lead concentration.*

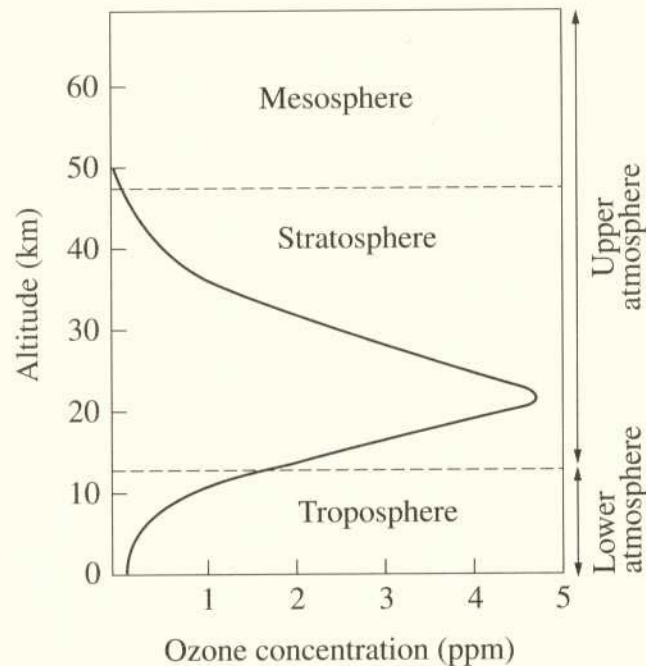
End of Question 26

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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.

In the upper atmosphere it is very helpful to life on earth, as it helps block harmful UV B and partially UV C radiation. It also helps block UVA, even though it is partially beneficial to us.

In the lower atmosphere, it is bad, as it contributes to photochemical fog, can cause breathing difficulties, and can act as a "heat blanket" - trapping heat in over the city.