

GCSE Chemistry B (Twenty First Century Science)
J258/02 Depth in chemistry (Foundation Tier)

Question Set 2

1 Nitrogen oxides are pollutant gases that are produced when coal burns in a power station

(a) (i) Nitrogen monoxide is one type of nitrogen oxide that is formed in a power station.

The reaction that forms nitrogen oxide can be shown in an equation.

nitrogen + → nitrogen monoxide

..... + O₂ → 2NO

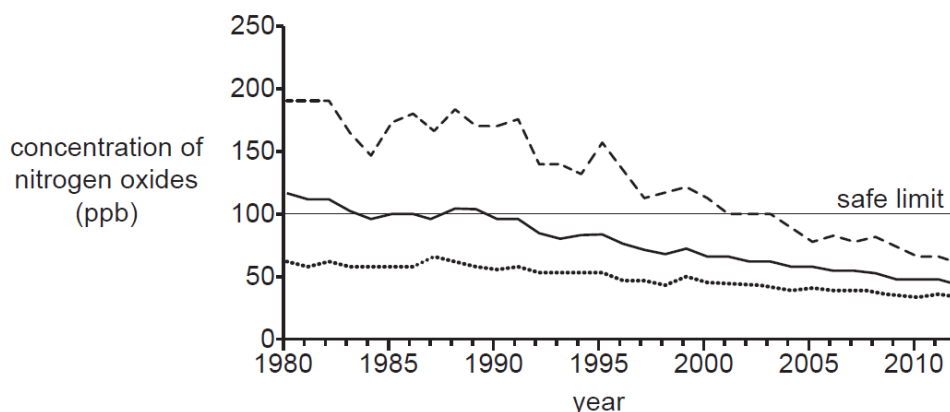
[2]

(ii) Which statements about nitrogen oxides are **true** and which are **false**? Put a tick (✓) in one box in each row.

	True	False
Nitrogen oxides are also produced in car engines.		
Nitrogen oxides form at very high temperatures.		
NO ₂ and NH ₃ are examples of nitrogen oxides.		

[2]

(b) The graph shows information about the concentration in parts per billion (ppb) of nitrogen oxides in the air between 1980 and 2012.



Key	
-----	highest daily concentration
.....	lowest daily concentration
————	mean daily concentration

Describe how the **highest daily** concentration of nitrogen oxides changed between 1980 and 2012.

[2]

(c) The World Health Organisation recommends a safe limit for people to be exposed to nitrogen oxides. They recommend that this limit is 100 ppb.

(i) Why is it necessary to set a safe limit for exposure to nitrogen oxides?

[1]

(ii) Layla and Mia talk about the graph.

Layla says that the nitrogen oxides have been below the safe limit since 1990.
Mia says that nitrogen oxides have only been below the safe limit since 2004.

Explain how the graph could be used to support both of these ideas.

[2]

Total Marks for Question Set 2: 9

Resource Materials

The Periodic Table of the Elements

(1)	(2)											(3)	(4)	(5)	(6)	(7)	(0)					
1 1 H hydrogen 1.0		<div style="border: 1px solid black; padding: 5px; text-align: center;"> Key atomic number Symbol name relative atomic mass </div>																				2 2 He helium 4.0
	2																					
3 3 Li lithium 6.9	4 4 Be beryllium 9.0											13 5 B boron 10.8	14 6 C carbon 12.0	15 7 N nitrogen 14.0	16 8 O oxygen 16.0	17 9 F fluorine 19.0	18 10 Ne neon 20.2					
11 11 Na sodium 23.0	12 12 Mg magnesium 24.3											13 13 Al aluminium 27.0	14 14 Si silicon 28.1	15 15 P phosphorus 31.0	16 16 S sulfur 32.1	17 17 Cl chlorine 35.5	18 18 Ar argon 39.9					
19 19 K potassium 39.1	20 20 Ca calcium 40.1	21 21 Sc scandium 45.0	22 22 Ti titanium 47.9	23 23 V vanadium 50.9	24 24 Cr chromium 52.0	25 25 Mn manganese 54.9	26 26 Fe iron 55.8	27 27 Co cobalt 58.9	28 28 Ni nickel 58.7	29 29 Cu copper 63.5	30 30 Zn zinc 65.4	31 31 Ga gallium 69.7	32 32 Ge germanium 72.6	33 33 As arsenic 74.9	34 34 Se selenium 79.0	35 35 Br bromine 79.9	36 36 Kr krypton 83.8					
37 37 Rb rubidium 85.5	38 38 Sr strontium 87.6	39 39 Y yttrium 88.9	40 40 Zr zirconium 91.2	41 41 Nb niobium 92.9	42 42 Mo molybdenum 95.9	43 43 Tc technetium	44 44 Ru ruthenium 101.1	45 45 Rh rhodium 102.9	46 46 Pd palladium 106.4	47 47 Ag silver 107.9	48 48 Cd cadmium 112.4	49 49 In indium 114.8	50 50 Sn tin 118.7	51 51 Sb antimony 121.8	52 52 Te tellurium 127.6	53 53 I iodine 126.9	54 54 Xe xenon 131.3					
55 55 Cs caesium 132.9	56 56 Ba barium 137.3	• 57–71 lanthanoids	72 72 Hf hafnium 178.5	73 73 Ta tantalum 180.9	74 74 W tungsten 183.8	75 75 Re rhenium 186.2	76 76 Os osmium 190.2	77 77 Ir iridium 192.2	78 78 Pt platinum 195.1	79 79 Au gold 197.0	80 80 Hg mercury 200.6	81 81 Tl thallium 204.4	82 82 Pb lead 207.2	83 83 Bi bismuth 209.0	84 84 Po polonium	85 85 At astatine	86 86 Rn radon					
87 87 Fr francium	88 88 Ra radium	• 89–103 actinoids	104 104 Rf rutherfordium	105 105 Db dubnium	106 106 Sg seaborgium	107 107 Bh bohrium	108 108 Hs hassium	109 109 Mt meitnerium	110 110 Ds darmstadtium	111 111 Rg roentgenium	112 112 Cn copernicium		114 114 Fl flerovium		116 116 Lv livermorium							

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