

## **GCSE Chemistry B (Twenty First Century Science)**

**J258/04** Depth in chemistry (Higher Tier)

### **Question Set 11**

1. Nitrogen oxides are pollutant gases that are produced when coal is burned in a power station.

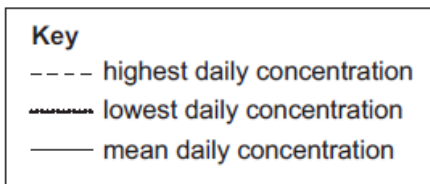
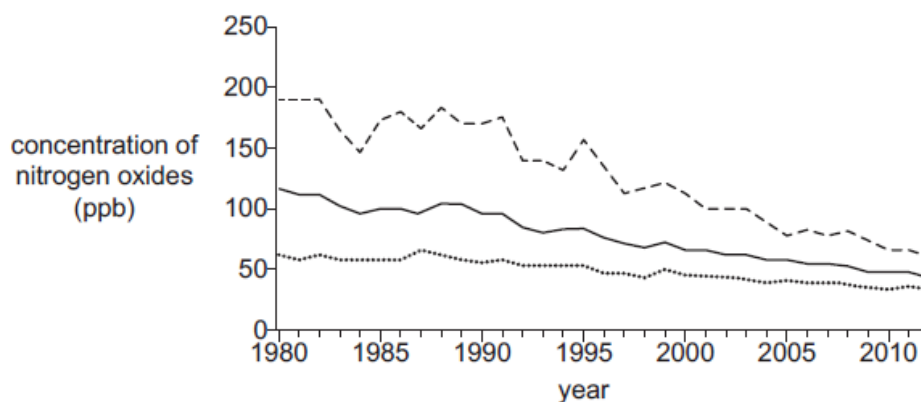
(a) Which statements about nitrogen oxides are **true** and which are **false**?

Put a tick (✓) in one box in each row.

	True	False
Nitrogen oxides form in an oxidation reaction.		
Nitrogen oxides come from impurities in the coal.		
Nitrogen oxides are acidic oxides.		
Ammonia is an example of a nitrogen oxide.		

[2]

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



(i) A scientist comments that the daily concentration of nitrogen oxides in 2012 has fallen by more than 50% compared to 1980.

To what extent does the data support this statement?

Use the data to explain your reasoning.

[3]

(ii) The concentration of nitrogen oxides is measured in ppb.

$$1 \text{ ppb} = 0.000\ 001 \text{ mg} / \text{cm}^3$$

What was the lowest daily concentration of nitrogen oxides in 1980?

Tick (✓) **one** box.

$$6.0 \times 10^{-5} \text{ mg} / \text{cm}^3$$

$$0.000\ 006 \text{ ppb}$$

$$60 \text{ mg} / \text{cm}^3$$

$$6.0 \times 10^{-1} \text{ ppb}$$

[1]

(c) Scientists first collect data about the concentration of nitrogen oxides in the air from a monitoring station near a power station.

They then set up 30 monitoring stations to collect data to work out a mean daily concentration of nitrogen oxide across the whole country.

Suggest some factors the scientists should consider when they choose where to set up these monitoring stations.

[2]

**Total Marks for Question Set 11: 8**

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