

A Level Chemistry B (Salters)
H433/01 Fundamentals of chemistry

Question Set 19

- 1 (a) (i) The use of cars can affect the concentration of ozone in the troposphere. Tropospheric ozone causes respiratory problems and photochemical smog.

Tropospheric ozone is formed in a series of reactions involving carbon monoxide, oxides of nitrogen and volatile organic compounds, all of which are present in exhaust emissions.

NO is a radical.

Draw a 'dot-and-cross' diagram of NO and explain why it is called a radical. Show outer electron shells only.

[1]

- 1 (b) (i) A series of reactions producing ozone from carbon monoxide, hydroxyl radicals and NO are shown in **equations 34.1 – 34.5** below.



Explain why the reaction in **equation 34.3** is classed as a propagation step.

[1]

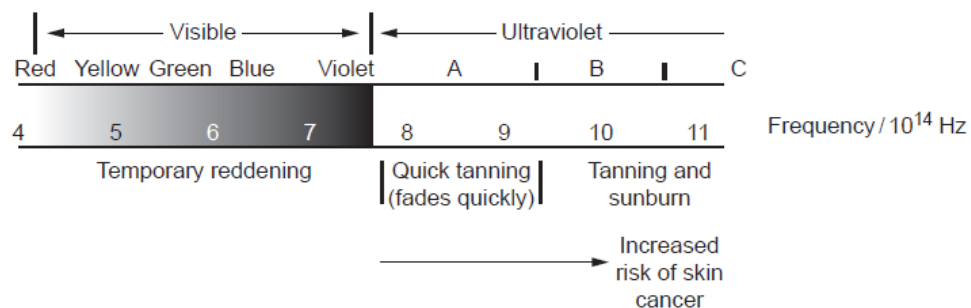
- 1 (b) (ii) Write the overall equation for the reaction sequence in **equations 34.1 – 34.5**. [1]

1 (c) Years ago, the air conditioning in cars used CFC-12, CCl_2F_2 .

CFC-12 absorbs some UV radiation when it breaks down.

The most harmful UV radiation from the Sun that causes damage to cells is in the range 10.1×10^{14} to 14.0×10^{14} Hz. Ozone in the stratosphere absorbs radiation in this range.

The diagram below shows the effects of different frequencies of UV on human skin.



Carry out some calculations, using the bond enthalpies below, and comment on the ability of CFC-12 to remove harmful UV when it breaks down.

Bond	Bond enthalpy / kJ mol^{-1}
C-Cl	+346
C-F	+467

[3]

Total Marks for Question Set 19: 6

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