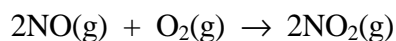


Marks
7

- Nitrogen monoxide, a noxious pollutant, reacts with oxygen to produce nitrogen dioxide, another toxic gas:



The following rate data were collected at 225 °C.

Experiment	[NO] ₀ (M)	[O ₂] ₀ (M)	Initial rate, -d[O ₂]/dt, (M s ⁻¹)
1	1.3×10^{-2}	1.1×10^{-2}	1.6×10^{-3}
2	1.3×10^{-2}	2.2×10^{-2}	3.2×10^{-3}
3	2.6×10^{-2}	1.1×10^{-2}	6.4×10^{-3}

Determine the rate law for the reaction.

Calculate the value of the rate constant at 225 °C.

Answer:

Calculate the rate of appearance of NO₂ when [NO] = [O₂] = 6.5×10^{-3} M.

Answer:

Suggest a possible mechanism for the reaction based on the form of the rate law.
Explain your answer.