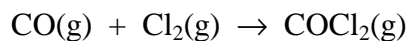


**Marks****4**

- Phosgene is a toxic gas prepared by the reaction of carbon monoxide with chlorine.



The following data were obtained in a kinetics study of its formation at 150 °C.

Experiment	Initial [CO] (mol L <sup>-1</sup> )	Initial [Cl <sub>2</sub> ] (mol L <sup>-1</sup> )	Initial rate (mol L <sup>-1</sup> s <sup>-1</sup> )
1	1.00	0.100	$1.29 \times 10^{-3}$
2	0.100	0.100	$1.33 \times 10^{-4}$
3	0.100	1.00	$1.30 \times 10^{-3}$
4	0.100	0.0100	$1.32 \times 10^{-5}$

Write the rate law for the formation of phosgene at 150 °C.

Calculate the value of the rate constant at 150 °C.

Answer:

Calculate the rate of appearance of phosgene when [CO] = [Cl<sub>2</sub>] = 1.3 M.

Answer: