Marks 5

- 2-Bromo-2-methylpropane reacts with hydroxide ions to give 2-methyl-2-propanol.

$$(CH_3)_3CBr + OH^- \rightarrow (CH_3)_3COH$$

The following rate data were collected at 55 °C.

Experiment	$[(CH_3)_3CBr]_0$ (M)	$[OH^-]_0$ (M)	Initial rate ($d[(CH_3)_3COH]/dt$, M s^{-1})
1	0.050	0.10	5.0×10^{-4}
2	0.20	0.10	2.0×10^{-3}
3	0.20	0.30	2.0×10^{-3}

Determine the rate law for the reaction.

Calculate the value of the rate constant at 55 °C.

Answer:

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