

16.2 Activation Energy

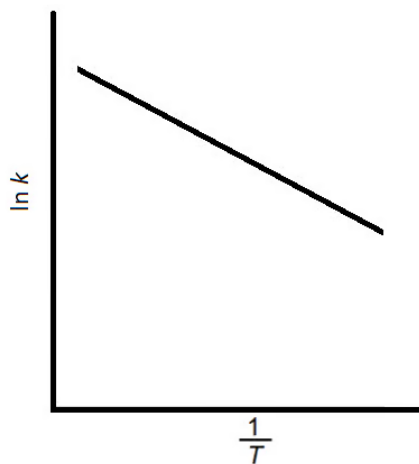
Question Paper

Course	DIPB Chemistry
Section	16. Chemical Kinetics (HL only)
Topic	16.2 Activation Energy
Difficulty	Easy

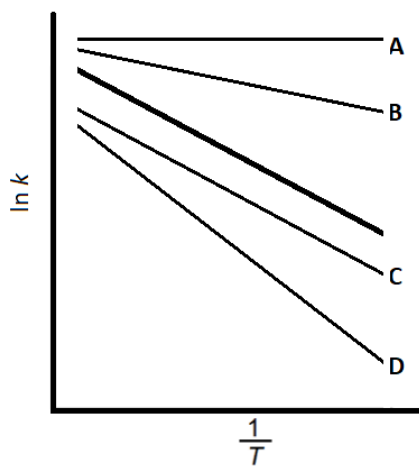
Time allowed: 10
Score: /5
Percentage: /100

Question 1

The graph below shows $\ln k$ against $\frac{1}{T}$ for a general reaction.



Which of the lines shows the highest activation energy compared to the original graph?



[1 mark]

Question 2

The following information was obtained for the rate constant, k , for a reaction at 298 K.

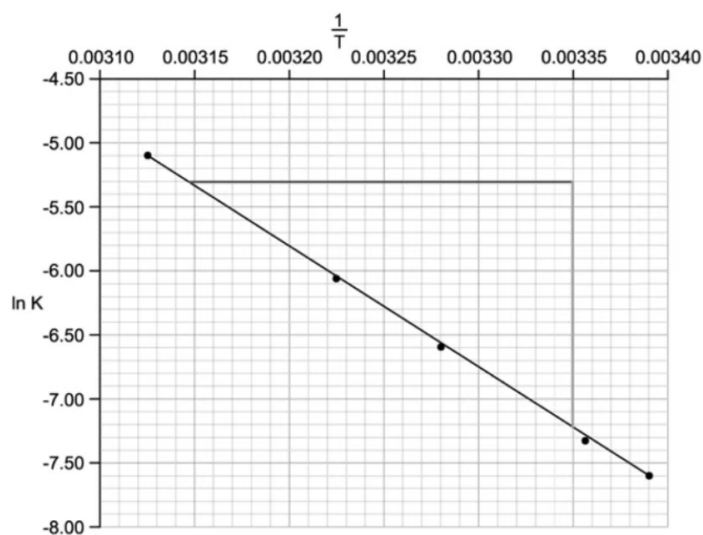
A	E_a	R
$2.57 \times 10^9 \text{ s}^{-1}$	96.2 kJ mol^{-1}	$8.31 \text{ J K}^{-1} \text{ mol}^{-1}$

Which expression correctly represents how to calculate the rate constant, k ?

- A. $2.57 \times 10^9 \times e^{(-96200 / 8.31 \times 298)}$
- B. $2.57 \times 10^9 \times e^{(-96.2 / 8.31 \times 298)}$
- C. $2.57 \times 10^9 \times e^{(8.31 \times 298 / -96.2)}$
- D. $2.57 \times 10^9 \times e^{(8.31 \times 298 / -96200)}$

[1 mark]

Question 3



Which of the following statements about the Arrhenius plot are **not** correct?

- A. $\ln A$ has an approximate value of -4.7
- B. The gradient of the line is $\frac{-E_a}{R}$
- C. The units for the x-axis are K^{-1}
- D. The equation of the line is $\ln k = \frac{-E_a}{RT} + \ln A$

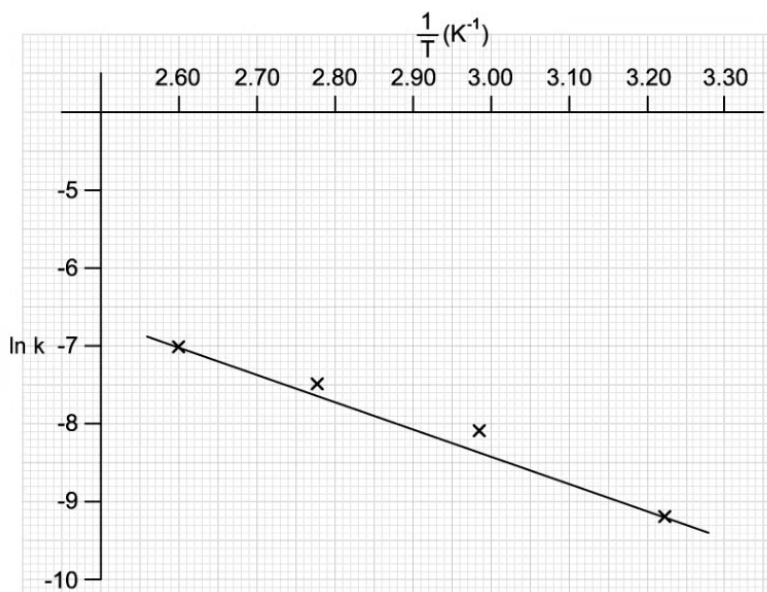
[1 mark]

Question 4Which term from the Arrhenius equation has the **incorrect** units?

	Term	Units
A.	E_a	J mol^{-1}
B.	R	$\text{J K}^{-1} \text{mol}^{-1}$
C.	T	K^{-1}
D.	e	No units

[1 mark]

Question 5



What is the gradient of the graph?

- A. $+E_a$
- B. $-E_a$
- C. $\frac{-E_a}{R}$
- D. $\frac{+E_a}{R}$

[1 mark]