

(AIEEE 2012)

278a. The equilibrium constant (K_c) for the reaction $\text{N}_2(\text{g}) + \text{O}_2(\text{g}) \rightarrow 2\text{NO}(\text{g})$ at temperature T is 4×10^{-4} . The value of K_c for

the reaction, $\text{NO}(\text{g}) \rightarrow \frac{1}{2} \text{N}_2(\text{g}) + \frac{1}{2} \text{O}_2(\text{g})$ at

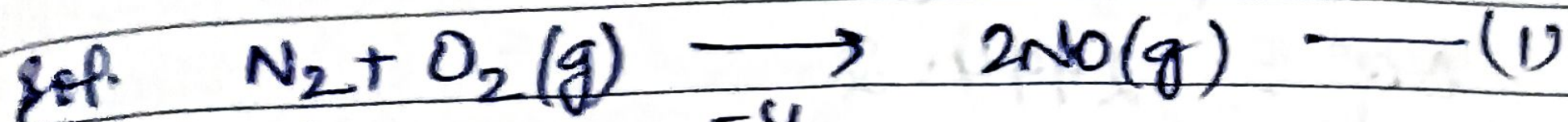
the same temperature is

(1) 2.5×10^2

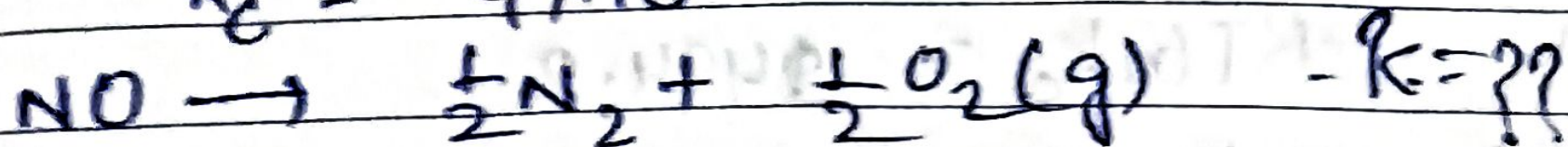
(2) 4×10^{-4}

✓ (3) 50.0

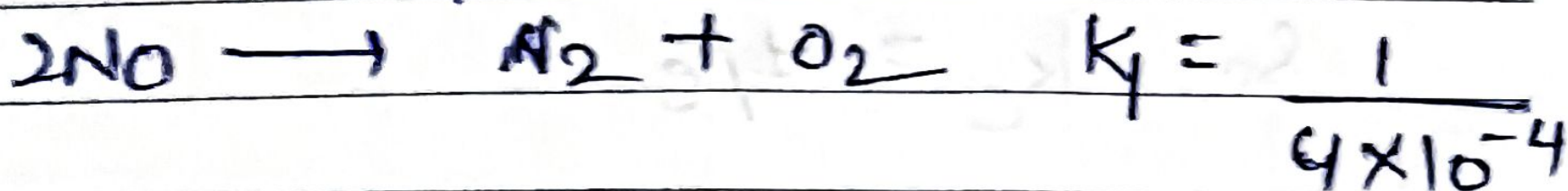
(4) 0.02



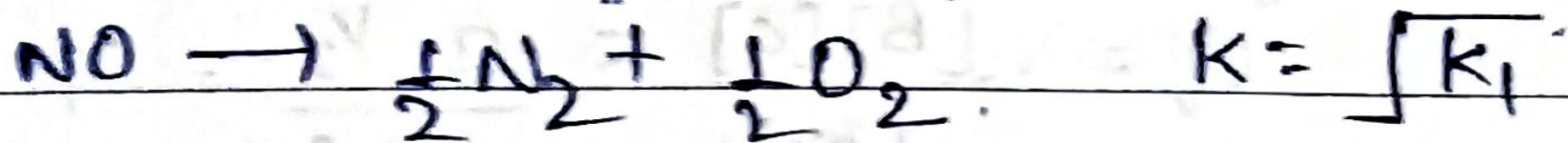
$$K_c = 4 \times 10^{-4}$$



Reverse the first equation;



Half the above equation;



So, required rate constant

$$= \sqrt{\frac{1}{4 \times 10^{-4}}} = \frac{1}{2 \times 10^{-2}} = \boxed{50.0}$$