

Previous year JEE questions 16

X mL of H_2 gas effuses through a hole in a container in 5 seconds. The time taken for the effusion of the same volume of the gas specified below under identical conditions is :

(1996 - 1 Mark)

- (a) 10 seconds : He (b) 20 seconds : O_2
(c) 25 seconds : CO (d) 55 seconds : CO_2

(b) Under identical conditions, $\frac{r_1}{r_2} = \sqrt{\frac{M_2}{M_1}}$

As rate of diffusion is also inversely proportional to

time, we will have, $\frac{t_2}{t_1} = \sqrt{\frac{M_2}{M_1}}$

(a) Thus, For He, $t_2 = \sqrt{\frac{4}{2}}(5s) = 5\sqrt{2}s \neq 10s$;

(b) For O_2 , $t_2 = \sqrt{\frac{32}{2}}(5s) = 20s$

(c) For CO, $t_2 = \sqrt{\frac{28}{2}}(5s) \neq 25s$;

(d) For CO_2 , $t_2 = \sqrt{\frac{44}{2}}(5s) \neq 55s$