

Match the following:

(a) $\Delta G^\circ > 0$

(i) $K > 1$

(b) $\Delta G^\circ < 0$

(ii) $K = 1$

(c) $\Delta G^\circ = 0$

(iii) $K = 0$

(iv) $K < 1$

Sol.

$$\Delta G^\circ = -RT \ln K$$

(a) $\Delta G^\circ > 0 \Rightarrow -RT \ln K > 0 \Rightarrow RT \ln K < 0$

$\Rightarrow \ln K < 0 \Rightarrow \boxed{K < 1} \Rightarrow (a) \rightarrow \text{(iv)}$

(b) $\Delta G^\circ < 0 \Rightarrow \ln K > 0 \Rightarrow K > 1 \Rightarrow (b) \rightarrow \text{(i)}$

(c) $\Delta G^\circ = 0 \Rightarrow \ln K = 0 \Rightarrow K = 1 \Rightarrow (c) \rightarrow \text{(ii)}$

Here the correct match is

$a \rightarrow \text{(iv)}, \quad b \rightarrow \text{(i)}, \quad c \rightarrow \text{(ii)}$

Note. $K = 0$ is practically impossible.