For the reaction $H_2 + I_2 \rightleftharpoons 2HI$. the standard free energy is $\Delta G^\circ > 0$. The equilibrium constant would be:

(a) $K = 0$ (b) $K > 1$ (c) $K = 1$ (d) $K < 1$.

Sol. we know that $\Delta G^\circ = -RT \ln K$.

Since $\Delta G^\circ > 0 \Rightarrow -RT \ln K > 0$

$\Rightarrow \ln K < 0$

$\Rightarrow \boxed{K < 1} \Rightarrow$ (d) option