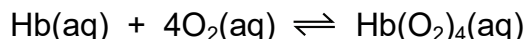


- 12 One molecule of haemoglobin, Hb, can bind with four molecules of oxygen according to the equation shown.



When the equilibrium concentration of  $\text{O}_2$  is  $7.6 \times 10^{-6} \text{ mol dm}^{-3}$ , the equilibrium concentrations of Hb and  $\text{Hb}(\text{O}_2)_4$  are equal.

What is the numerical value of  $K_c$  for this equilibrium?

- A**  $3.0 \times 10^{20}$       **B**  $1.3 \times 10^5$       **C**  $7.6 \times 10^{-6}$       **D**  $3.3 \times 10^{-21}$

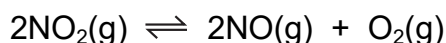
- 13 In the Contact process, sulfur dioxide and oxygen react to form sulfur trioxide.

In the Haber process, nitrogen and hydrogen react to form ammonia.

Which statement about these processes is correct?

- A**  $K_p$  for the Haber process has no unit.  
**B** In the Contact process, the value of  $K_p$  falls when pressure is increased at constant T.  
**C** The Haber process uses a homogeneous catalyst.  
**D** When  $\text{V}_2\text{O}_5$  is used in the Contact process, the position of equilibrium is unchanged.

- 12 Nitrogen dioxide decomposes on heating according to the equation shown.



When 4 mol of nitrogen dioxide were put into a  $1 \text{ dm}^3$  container and heated to a constant temperature, the equilibrium mixture contained 0.8 mol of oxygen.

What is the value of the equilibrium constant,  $K_c$ , at the temperature of the experiment?

- A**  $\frac{0.8^2 \times 0.8}{4^2}$       **B**  $\frac{1.6 \times 0.8}{2.4^2}$       **C**  $\frac{1.6^2 \times 0.8}{4^2}$       **D**  $\frac{1.6^2 \times 0.8}{2.4^2}$