ASSIGNMENT 3

Hydrolysis of sucrose gives,
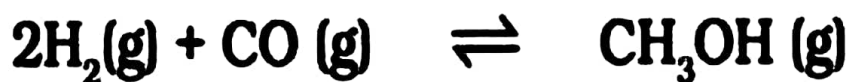
Sucrose + $H_2O \rightleftharpoons$ Glucose + Fructose

Equilibrium constant K_c for the reaction is 2×10^{13} at 300K. Calculate $\Delta G^{\ominus}$ at 300K.

Ans)
$$\Delta G^o = -RT \ln K_c$$
$$= -8.314 \times 300 \times \ln(2 \times 10^{13})$$
$$= -7.64 \times 10^4 \ J/mol$$

Describe the effect of :

a) addition of H_2
b) addition of CH_3OH
c) removal of CO
d) removal of CH_3OH

on the equilibrium of the reaction:

$$2H_2(g) + CO\ (g) \rightleftharpoons CH_3OH\ (g)$$

Ans) (a) addition of H_2

(increasing concentration of reactants)

means equilibrium shifts forward direction

(b) addition of CH_3OH

(increases in concentration of products)

means equilibrium shifts the backward direction.

(c) Removal of CO

if we remove the CO then

equilibrium shifts the backward direction.

(d) Removal of CH_3OH

equilibrium shifts in forward direction.