Table 3–1 Relationship Between the Standard Free-Energy Change, ΔG^o, and Equilibrium Constant

EQUILIBRIUM CONSTANT $\frac{[X]}{[Y]} = K$	FREE ENERGY OF X MINUS FREE ENERGY OF Y (kcal/mole)
10^5	–7.1 (–29.7)
10^4	–5.7 (–23.8)
10^3	–4.3 (–18.0)
10^2	–2.8 (–11.7)
10	–1.4 (–5.9)
1	0 (0)
10^{-1}	1.4 (5.9)
10^{-2}	2.8 (11.7)
10^{-3}	4.3 (18.0)
10^{-4}	5.7 (23.8)
10^{-5}	7.1 (29.7)

Values of the equilibrium constant were calculated for the simple chemical reaction $Y \rightleftharpoons X$ using the equation given in the text.

The ΔG° given here is in kilocalories per mole at 37°C, with kilojoules per mole in parentheses (1 kilocalorie is equal to 4.184 kilojoules). As explained in the text, ΔG° represents the free-energy difference under standard conditions (where all components are present at a concentration of 1.0 mole/liter).

From this table, we see that if there is a favorable free-energy change of –4.3 kcal/mole (–18.0 kJ/mole) for the transition $Y \rightarrow X$, there will be 1000 times more molecules in state X than in state Y.