

RELATIONSHIP OF ΔG° & $\Delta G^{\circ'}$:

FOR A REACTION OCCURRING IN DILUTE AQUEOUS SOLUTION
BUFFERED AT pH 7:

$$\Delta G^{\circ'} = \Delta G^\circ + RT \ln [H^+] \quad \leftarrow \text{KNOW THIS EQ.}$$

↓ pH 7

$$\Delta G^{\circ'} = \Delta G^\circ + RT \ln 1 \times 10^{-7}$$

WHY?



$$\Delta G = \Delta G^\circ + RT \ln \frac{[C][H^+]}{[A][B]}$$

← THIS IS WHAT YOU WOULD
USE IF YOU WERE GIVEN
 ΔG° INSTEAD OF $\Delta G^{\circ'}$

↓ REWRITE

$$\Delta G = \Delta G^\circ + RT \ln \frac{[C]}{[A][B]} + RT \ln [H^+]$$

↓ COMBINE

$$\Delta G = (\Delta G^\circ + RT \ln [H^+]) + RT \ln \frac{[C]}{[A][B]}$$

↓ SINCE $\Delta G^{\circ'} = \Delta G^\circ + RT \ln [H^+]$

$$\Delta G = \Delta G^{\circ'} + RT \ln \frac{[C]}{[A][B]}$$

← IF GIVEN $\Delta G^{\circ'}$ YOU
WOULD USE THIS ONE