

Chemistry - 4311  
November 20, 2015

Exam #3

Name

Ker

(20) 1. Matching (use a letter only once)

$\Delta G_r^\circ$  equals a.

At equilibrium j is zero.

$\Delta G_r$  and  $\Delta G_r^\circ$  are related according to h.

The membrane potential for  $K^+$  ions is n.

The relationship between the equilibrium constant and  $\Delta H_r^\circ$  is given by c.

The Nernst equation is d.

In an electrochemical cell oxidation takes place at the k.

The relationship between  $\Delta G_r$  and the electrochemical potential is b.

For the reaction  $O_2(g) + 4H^+ + 4e^- \rightarrow 2H_2O$  decreasing  $[H^+]$  will r E.

t is one reason  $\Delta G_r^\circ$  for ATP hydrolysis is negative.

$c = 3.00 \times 10^8 \text{ m/s}$

$F = 96,500 \text{ coulombs}$

$h = 6.626 \times 10^{-34} \text{ J s}$

$R = 8.314 \text{ J/mol-K}$

$R = 1.987 \text{ cal/mol-K}$

$R = 0.08206 \text{ L-atm/mol-K}$

$N_A = 6.02 \times 10^{23}$

$1 \text{ atm} = 101.325 \text{ kPa}$

$k_B = 1.381 \times 10^{-23} \text{ J/K}$

a.  $-RT \ln K$

b.  $\Delta G_r = -vFE$

c.  $\ln K = -\Delta H_r^\circ / RT + C$

d.  $E = E^\circ - (RT/vF) \ln Q$

e. increase

f. weak hydrogen bonds

g.  $\Delta G_r^\circ$

h.  $\Delta G_r = \Delta G_r^\circ + RT \ln Q$

i.  $E^\circ - 0.0257 \text{ V} \ln [K^+]$

j.  $\Delta G_r$

k. anode

l.  $\Delta G_r = \Delta G_r^\circ + RT \ln K$

m.  $\Delta G_r = vF/E$

n.  $0.0257 \text{ V} \ln \{ [K^+]_{\text{ex}} / [K^+]_{\text{in}} \}$

o.  $E^\circ = (RT/vF) \ln Q$

p.  $-RT \ln Q$

q. cathode

r. decrease

s.  $K = -\Delta H_r^\circ / RT + C$

t. electrostatic repulsion

