Chemistry 141 Name

Dr. Cary Willard

Quiz 4A (20 points) February 25, 2014

1. (4 points) Identify the following for the balanced chemical reaction below

0 +1 -2 +3 -2 +2 -2 +1 +2 -2

Cd(s) + H2O(l) + Ni2O3(s) 🡪 Cd(OH)2(s) + 2NiO(s)

Element oxidized Cd Oxidizing agent Ni2O3(s)

Element reduced Ni Reducing agent Cd(s)

1. (8 points) Balance the following half reactions
   1. (acidic) Cr2O7-2(aq) 🡪 Cr+3(aq)

14 H+ (aq) + Cr2O7-2(aq) + 6e- 🡪 2 Cr+3(aq) + 7 H2O(l)

* 1. (basic) Bi3+(aq) 🡪 BiO3-1(aq)

3 H2O + Bi+3(aq) 🡪 BiO3-1(aq) + 6 H+(aq) + 2e-

6 H+(aq) + 6 OH-(aq) 🡪 6 H2O(l)

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Bi+3(aq) + 6 OH-(aq) 🡪 BiO3-1(aq) + 3 H2O(l) + 2e-

1. (8 points) Balance the following redox reaction in acid. Show the two half reactions.

Zn(s) + VO2+(aq) 🡪 Zn2+(aq) + V3+

Half reaction 1 -

Zn(s) -> Zn+2(aq) + 2 e-

Half reaction 2 -

(1 e- + VO+2(aq) + 2 H+(aq) 🡪 V+3(aq) + H2O(l)) 2

Overall reaction balanced in acid

Zn(s) + 2e- + 2 VO+2(aq) + 4 H+(aq) 🡪 Zn2+(aq) + 2e- + 2 V+3(aq) + 2 H2O(l)

Zn(s) + 2 VO+2(aq) + 4 H+(aq) 🡪 Zn2+(aq) + 2 V+3(aq) + 2 H2O(l)

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Quiz 4B (20 points) February 25, 2014

1. (4 points) Identify the following for the balanced chemical reaction below

0 +2 -3 0 +1 -2 +1 +2 -3 -2 +1

4Ag(s) + 8CN-1(aq) + O2(g) + 2H2O(l) 🡪 4Ag(CN)2-1(aq) + 4OH-1(aq)

Element oxidized Ag Oxidizing agent O2(g)

Element reduced O Reducing agent Ag(s)

1. (8 points) Balance the following half reactions
   1. (acidic) NO3-1(aq) 🡪 NO2(g)

2 H+(aq) + NO3-1(aq) + 1 e- 🡪 NO2(g) + H2O(l)

* 1. (basic) Br2(l) 🡪 BrO3-1(aq)

6 H2O(l) + Br2(l) 🡪 2 BrO3-1(aq) + 12 H+(aq) + 10 e-

12 H+(aq) + 12 OH-(aq) 🡪 12 H2O(l)

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Br2(l) + 12 OH-(aq) 🡪 2 BrO3-1(aq) + 6 H2O(l) + 10 e-

1. (8 points) Balance the following redox reaction in acid. Show the two half reactions.

Mg(s) + VO43-(aq) 🡪 Mg2+(aq) + V2+(aq)

Half reaction 1 -

(Mg(s) 🡪 Mg+2(aq) + 2e-) 3

Half reaction 2 -

(3 e- + VO4-3(aq) + 8 H+(aq) 🡪 V+2(aq) + 4 H2O(l)) 2

Overall reaction balanced in acid

3Mg(s) + 6e- + 2VO4-3(aq) + 16H+(aq) 🡪 3Mg+2(aq) + 6e- + 2V+2(aq) + 8H2O(l)

3 Mg(s) + 2 VO4-3(aq) + 16 H+(aq) 🡪 3 Mg+2(aq) + 2 V+2(aq) + 8 H2O(l)