Chemistry 141 Name

Dr. Cary Willard

Quiz 4A (20 points) March 6, 2013

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

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

Element oxidized Cd Oxidizing agent Ni2O3

Element reduced Ni Reducing agent Cd(s)

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

Cr2O7-2 (aq) + 14 H+1 + 6 e-1 🡪 2 Cr+3 (aq) + 7 H2O

* 1. (basic) Bi3+(aq) 🡪 BiO3-1

Bi3+(aq) + 3 H2O 🡪 BiO3-1 + 6 H+1 + 2 e-1

6 H+1 + 6 OH− 🡪 6 H2O

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Bi3+(aq) + 6 OH− 🡪 3 H2O + BiO3-1 + 2 e-1

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) 🡪 Zn2+(aq) + 2 e-1

Half reaction 2 -

VO2+(aq) + 2 H+1 + 1 e-1🡪 V3+ + H2O

Overall reaction balanced in acid

Zn(s) + 2 VO2+(aq) + 4 H+1🡪 Zn2+(aq) + 2 V3+ + 2 H2O

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Quiz 4B (20 points) March 6, 2013

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

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

Element oxidized Ag Oxidizing agent O2

Element reduced O Reducing agent Ag

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

NO3-1 + 2 H+1 + 1 e-1🡪 NO2 + H2O

* 1. (basic) Br2 🡪 BrO3-1

Br2 + 6 H2O 🡪 2 BrO3-1 + 12 H+1 + 10 e-1

12 H+1 + 12 OH− 🡪 12 H2O

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Br2 + 12 OH−🡪 2 BrO3-1 + 6 H2O + 10 e-1

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) 🡪 Mg2+(aq) + 2 e-1

Half reaction 2 -

VO43-(aq) + 8 H+1 + 3 e-1🡪 V2+(aq) + 4 H2O

Overall reaction balanced in acid

3 Mg(s) + 2 VO43-(aq) + 16 H+1 🡪 3 Mg2+(aq) + 2 V2+(aq) + 8 H2O