Chemistry 141 Name Key

Dr. Cary Willard

Quiz 3A (20 points) February 17, 2009

1. (6 points) Assign oxidation states to each atom in the following species
   1. S8 S 0
   2. Cr2O7-2 Cr +6 O -2
2. (4 points) For the following balanced redox reaction identify the elements oxidized and reduced as well as the oxidizing and reducing agents

4HCl(aq) + Hg2Cl2(s) + 2KNO2(aq) 🡪 2HgCl2(aq) + NO(g) + 2KCl(aq) +2H2O(l)

Element oxidized Hg Element reduced N

Oxidizing agent KNO2 or NO2-1 Reducing agent Hg2Cl2

1. (4 points) Balance the following half reaction in basic solution.

3 e-1 + 4 H+1 + MnO4-1(aq) 🡪 MnO2(aq) + 2 H2O

4 H2O 🡪 4 H+ + 4 OH-1

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3 e-1 + MnO4-1 + 2 H2O 🡪 MnO2 + 4 OH-1

1. (6 points) Balance the following reaction in acid.

Ni+2 + SO2 🡪 Ni + SO4-2

Ni+2 + 2e-1  🡪 Ni

SO2 + 2 H2O 🡪 SO4-2 + 4 H+ + 2e-1

Ni+2 + SO2 + 2 H2O 🡪 Ni + SO4-2 + 4 H+

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Quiz 3B (20 points) February 17, 2009

1. (6 points) Assign oxidation states to each atom in the following species
   1. I2 I 0
   2. MnO4-1 Mn +7 O -2
2. (4 points) For the following balanced redox reaction identify the elements oxidized and reduced as well as the oxidizing and reducing agents

6HCl(aq) + 2KMnO4(aq) + 5H2O2(aq) 🡪 2MnCl2(aq) + 5O2(g) + 8 H2O(l) + 2KCl(aq)

Element oxidized O Element reduced Mn

Oxidizing agent KMnO4 Reducing agent H2O2

1. (4 points) Balance the following half reaction in basic solution.

ClO3-1(aq) + H2O 🡪 ClO4-1(aq) + 2 e-1 + 2 H+1

2 H+1 + 2 OH-1 🡪 2 H2O

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ClO3-1(aq) + 2 OH-1 🡪 ClO4-1(aq) + H2O + 2 e-1

1. (6 points) Balance the following reaction in acid.

Fe+2 + SO2 🡪 Fe + SO4-2

Fe+2 + 2e-1  🡪 Fe

SO2 + 2 H2O 🡪 SO4-2 + 4 H+ + 2e-1

Fe+2 + SO2 + 2 H2O 🡪 Fe + SO4-2 + 4 H+