Chemistry 141 Name key

Dr Cary Willard October 3, 2012

Quiz 4a (20 points)

1. (4 points) For the following balanced redox reaction identify the elements oxidized and reduced as well as the oxidizing and reducing agents

K2Cr2O7 + 6 FeSO4 + 7H2SO4 🡪 Cr2(SO4)3 + 3 Fe2(SO4)3 + K2SO4 + 7 H2O

 Element oxidized Fe Element reduced Cr

 Oxidizing agent K2Cr2O7 Reducing agent FeSO4

1. (8 points) Balance the following redox reaction in acid. Show the two half reactions and tell which is an oxidation and which is a reduction.

S2O32– + Br2 🡪 SO42– + Br–

Half reaction 1 -

S2O32– + 5 H2O 🡪 2 SO42– + 10 H+ + 8e–

Half reaction 2 -

( Br2 + 2e–🡪 2 Br– ) 4

Overall reaction balanced in acid

S2O32– + 5 H2O + 4 Br2 🡪 2 SO42– + 8 Br– + 10 H+

1. (8 points) Balance the following redox reaction in base. Show the two half reactions and tell which is an oxidation and which is a reduction.

MnO4– + Cl1– 🡪 MnO2 + ClO3–

Half reaction 1 - (oxidation or reduction)

( MnO4– + 4 H+ + 3e–🡪 MnO2 + 2 H2O ) 2

Half reaction 2 - (oxidation or reduction)

 3 H2O + Cl1– 🡪 ClO3– +6 H+ + 6e–

Overall reaction balanced in acid (optional)

2 MnO4– + Cl1– + 2 H+ 🡪 2 MnO2 + ClO3– + H2O

 2 H2O 🡪 2 H+ + 2 OH–

Overall reaction balanced in base

2 MnO4– + Cl1– + H2O 🡪 2 MnO2 + ClO3– + 2 OH–

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Quiz 4a (20 points)

1. (4 points) For the following balanced redox reaction identify the elements oxidized and reduced as well as the oxidizing and reducing agents

2 KMnO4 + 5 K2C2O4 + 8H2SO4 🡪 2 MnSO4 + 10 CO2 + 6 K2SO4 + 8 H2O

 Element oxidized C Element reduced Mn

 Oxidizing agent KMnO4 Reducing agent K2C2O4

1. (10 points) Balance the following redox reaction in acid. Show the two half reactions and tell which is an oxidation and which is a reduction.

S2O32– + Cl2 🡪 SO42– + Cl–

Half reaction 1 -

S2O32– + 5 H2O 🡪 2 SO42– + 10 H+ + 8e–

Half reaction 2 -

( Cl2 + 2e–🡪 2 Cl– ) 4

Overall reaction balanced in acid

S2O32– + 5 H2O + 4 Cl2 🡪 2 SO42– + 8 Cl– + 10 H+

1. (10 points) Balance the following redox reaction in base. Show the two half reactions and tell which is an oxidation and which is a reduction.

MnO4– + Br1– 🡪 MnO2 + BrO3–

Half reaction 1 - (oxidation or reduction)

( MnO4– + 4 H+ + 3e–🡪 MnO2 + 2 H2O ) 2

Half reaction 2 - (oxidation or reduction)

 3 H2O + Br1– 🡪 BrO3– +6 H+ + 6e–

Overall reaction balanced in acid (optional)

2 MnO4– + Br1– + 2 H+ 🡪 2 MnO2 + BrO3– + H2O

 2 H2O 🡪 2 H+ + 2 OH–

Overall reaction balanced in base

2 MnO4– + Br1– + H2O 🡪 2 MnO2 + BrO3– + 2 OH–