Redox reaction examples with answers answer sheets printable free

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Regents Review **Redox Worksheet** **Mr. Bonachamp**

1. What is the oxidation number of chromium in the chromate ion, CrO_4^{2-} ?
   A. +6 C. +3
   B. +2 D. +8

2. What is the oxidation number assigned to manganese in $KMnO_4$?
   A. +7 C. +3
   B. +2 D. +4

3. Which change occurs when Fe^{3+} is reduced?
   A. The Fe^{3+} gains electrons and its oxidation number increases.
   B. The Fe^{3+} gains electrons and its oxidation number decreases.
   C. The Fe^{3+} loses electrons and its oxidation number increases.
   D. The Fe^{3+} loses electrons and its oxidation number decreases.

4. Given the balanced ionic equation representing a reaction:

$$2Al^{3+}(aq) + 3Mg(s) \rightarrow 2Al(s) + 3Mg^{2+}(aq)$$

   In this reaction, electrons are transferred from
   A. Al to Mg^{2+} C. Mg to Al^{3+}
   B. Al^{3+} to Mg D. Mg^{2+} to Al

5. Half-reactions can be written to represent all
   A. double-replacement reactions
   B. neutralization reactions
   C. fusion and fission reactions
   D. oxidation-reduction reactions

6. In an oxidation–reduction reaction, reduction is defined as the
   A. loss of protons C. loss of electrons
   B. gain of protons D. gain of electrons

7. In which reaction are electrons transferred from one reactant to another reactant?
   A. $2Cu(s) + O_2(g) \rightarrow 2CuO(s)$
   B. $AgNO_3(aq) + KCl(aq) \rightarrow AgCl(s) + KNO_3(aq)$
   C. $HCl(aq) + NaOH(aq) \rightarrow NaCl(aq) + H_2O(l)$
   D. $H_3O^+(aq) + OH^-(aq) \rightarrow 2H_2O(l)$

8. Which balanced equation represents a redox reaction?
   A. $AgNO_3 + NaCl \rightarrow AgCl + NaNO_3$
   B. $BaCl_2 + K_2CO_3 \rightarrow BaCO_3 + 2KCl$
   C. $CaO + CO_2 \rightarrow Ca + CO_3$
   D. $HCl + KOH \rightarrow KCl + H_2O$

9. Which metal reacts spontaneously with a solution containing zinc ions?
   A. magnesium C. copper
   B. nickel D. silver

10. Which reaction is an example of an oxidation–reduction reaction?
    A. $AgNO_3 + KI \rightarrow AgI + KNO_3$
    B. $Cu + 2AgNO_3 \rightarrow Cu(NO_3)_2 + 2Ag$
    C. $2KOH + H_2SO_4 \rightarrow K_2SO_4 + 2H_2O$
    D. $Ba(OH)_2 + 2HCl \rightarrow BaCl_2 + 2H_2O$

11. Given the reaction:

$$2Al(s) + Fe_2O_3(s) \xrightarrow{heat} Al_2O_3(s) + 2Fe(s)$$

    Which species undergoes reduction?
    A. Al C. Al^{+3}
    B. Fe D. Fe^{+3}

12. According to Reference Table J, which of these metals will react most readily with 1.0 M HCl to produce H_2 gas?
    A. Cu C. Mg
    B. K D. Zn

13. Given the balanced equation representing a redox reaction:

$$3Ni + 2Cr^{3+} \rightarrow 2Ni^{2+} + 3Cr$$

    Which statement is true about this reaction?
    A. Each Ni loses 2e⁻ and each Cr^{3+} gains 3e⁻.
    B. Each Ni loses 3e⁻ and each Cr^{3+} gains 2e⁻.
    C. Each Ni^{2+} gains 2e⁻ and each Cr loses 3e⁻.
    D. Each Ni^{2+} gains 3e⁻ and each Cr loses 2e⁻.

14. Given the redox reaction:

$$Cr^{3+} + Al \rightarrow Cr + Al^{3+}$$

    As the reaction takes place, there is a transfer of
    A. electrons from Al to Cr^{3+} C. protons from Al to Cr^{3+}
    B. electrons from Cr^{3+} to Al D. protons from Cr^{3+} to Al

15. Which half-reaction correctly represents reduction?
    A. $Ag \rightarrow Ag^+ + e^-$
    B. $I_2 \rightarrow 2I^- + 2e^-$
    C. $Au^{3+} + 3e^- \rightarrow Au$
    D. $Fe^{2+} + e^- \rightarrow Fe^{3+}$

16. Which reaction shows conservation of both mass and charge?
    A. $Cl_2 + Ba^{2+} \rightarrow Cl^- + Ba_2$
    B. $Cu + 2Ag^+ \rightarrow Cu^{2+} + Ag$
    C. $Zn + Cl^{2+} \rightarrow Zn^{2+} + Cr$
    D. $Ni + Pb^{2+} \rightarrow Ni^{2+} + Pb$

17. Which half-reaction occurs at the anode in a voltaic cell?
    A. $Ni^{2+} + 2e^- \rightarrow Ni$ C. $Zn \rightarrow Zn^{2+} + 2e^-$
    B. $Sn + 2e^- \rightarrow Sn^{2+}$ D. $Fe^{3+} \rightarrow Fe^{2+} + e^-$

Page 1

Name _____ Date _____

A Road Map

A **road map** shows the roads in a place. Road maps can show small areas, like the streets in a town. Or the maps can show large areas, like highways across the United States. These maps show how to move from one place to another. They also show how far apart the places are. A **distance scale** is like a small ruler on a map. It shows the distance in miles.

Directions **Look at the map of west Texas. Answer the questions.**

1. Find Amarillo on the map. What is the major east-west road that passes through Amarillo?

2. Find Lubbock on the map. What is the distance between Amarillo and Lubbock?

3. Find Muleshoe on the map. What direction(s) would you travel from Amarillo to Muleshoe?

Name: _____ Class: _____ Date:

NEWTON'S LAWS WORKSHEET

Directions: Fill in the information below. Use the word bank below to help you with the completion questions:

velocity unbalanced lower accelerate
speed balanced action-reaction mass
inertia force and acceleration equal action
direction greater opposite

I. NEWTON'S FIRST LAW OF MOTION

1. Newton's first law of motion is also known as the LAW OF _____.
2. Newton's first law says that
   a. an object that IS NOT MOVING, or is at _____, will stay at _____. **AND**
   b. an object that IS MOVING will keep moving with constant _____, which means at the rate _____ and in the same _____. **UNLESS**
   c. an _____ force acts on that object.
3. What is inertia?
4. What property of an object determines how much inertia it has?
5. Which of the following has more inertia?
   a. Bowling ball or Tennis ball
   b. Hammer or Feather

II. NEWTON'S SECOND LAW OF MOTION

6. Newton's second law of motion is also known as the LAW OF _____.
7. Newton's second law says that when an _____ force is applied to a _____, it causes it to _____.
8. The greater the force that is applied, the _____ the acceleration.
9. The lesser the force that is applied, the _____ the acceleration.
10. If the same force is applied to an object with a large mass, it will have a _____ acceleration.

Types of Chemical Reaction Worksheet Name:_____

Balance the reactions and indicate which types of chemical reaction are being represented:

a) ____ NaBr + ____ $Ca(OH)_2$ → ___ $CaBr_2$ + ____ NaOH Reaction Type : _____
b) ____ NH_3+ ____ H_2SO_4 → ____ $(NH_4)_2SO_4$ Reaction Type : _____
c) ____ C_2H_5O + ____ O_2 → ____ CO_2 + ____ H_2O Reaction Type : _____
d) ____ Pb + ____ H_3PO_4 → ____ H_2 + ____ $Pb_3(PO_4)_2$ Reaction Type : _____
e) ____ Li_3N + ____ NH_4NO_3 → ___ $LiNO_3$ + ___ $(NH_4)_3N$ Reaction Type : _____
f) ____ HBr + ___ $Al(OH)_3$ → ___ H_2O + ___ $AlBr_3$ Reaction Type : _____
g) ___ Na_3PO_4 + ___ KOH → ___ NaOH + ____K_3PO_4 Reaction Type _____
h) ___ $MgCl_2$ + ___Li_2CO_3 → ___ $MgCO_3$ + ___ LiCl Reaction Type _____
i) ___ C_6H_{12} + ___ O_2 → ___CO_2 + ___H_2O Reaction Type _____
j) Pb + $FeSO_4$ → $PbSO_4$ + Fe Reaction Type _____
k) $CaCO_3$ → CaO + CO_2 Reaction Type _____
l) P_4 + O_2 → P_2O_3 Reaction Type _____
m) $RbNO_3$ + BeF_2 → $Be(NO_3)_2$ + RbF Reaction Type _____
n) $AgNO_3$ + Cu → $Cu(NO_3)_2$ + Ag Reaction Type _____
o) C_2H_6O + O_2 → CO_2 + H_2O Reaction Type _____
p) C_2H_5 + Fe → $Fe(C_2H_5)_2$ Reaction Type _____
q) $SeCl_6$ + O_2 → SeO_2 + Cl_2 Reaction Type _____
r) MgI_2 + $Mn(SO_3)_2$ → $MgSO_3$ + MnI_4 Reaction Type _____
s) O_3 → O + O_2 Reaction Type _____
t) NO_2 → O_2 + N_2 Reaction Type _____

To determine relative oxidizing and reducing strengths of a series of metals and ions. 1 To explore the relative oxidizing and reducing strengths of different metals. 2 To gain practice working with electrochemical cells. 3 To use experimentally determined cell potentials to rank reduction half-reactions. The movement or transfer of electrons is central to our understanding of chemical reactions. The study of the transfer of electrons from one reactant to another is the study of electrochemistry. Electrons can move spontaneously from higher energy levels to lower energy levels within an atom. A similar movement can take place between two different chemical reactants. If there are electrons in one reactant that are at higher energy than unfilled orbitals of the other reactant, the high energy electrons can transfer to the unfilled orbitals at lower energy. This transfer of electrons from one chemical substance to another is known as an oxidation-reduction (redox) or electron transfer reaction. Consider the redox reaction (1) and Figure 1 below: (1) Zn(s) + Cu2+(aq) ¢ÃÂÂ Zn2+(aq) + Cu(s)Ã Â Figure 1: Energy Diagram for Reaction between Zinc Metal and Copper(II) Ion. One reactant, zinc metal, has a pair of electrons at a much higher energy level than an unfilled orbital in the other reactant, copper(II) ion. The electrons in the higher energy orbital in zinc can spontaneously move to the lower energy orbital in copper(II). This electron transfer is a redox reaction. As the reactant with the high energy electrons "loses" its electrons, its oxidation state increases. In this example, elemental zinc has an oxidation state of 0; loss of two electrons raises its oxidation state to +2. Loss of electrons is an oxidation reaction. Conversely, as the reactant with the low energy orbital "gains" electrons, its oxidation state is reduced. Copper(II) has an oxidation state of +2; the elemental metal has an oxidation state of 0. of electrons is a reduction reaction. In a Redox reaction, the reagent that loses electrons (is oxidized) causes a reduction and is called reducing agent. In the example above, the zinc metal is the reducing agent; He loses two electrons (is oxidized) and becomes ion zn2+. The reagent that gains electrons (is reduced) causes oxidation and is called oxidant agent. IONE CU2+ earns two electrons (is reduced) to form copper metal. To have a complete and balanced Redox system, there must be at least one reduction and oxidation;

One cannot occur without the other and will occur simultaneously. For a balanced system, the number of electrons lost in the oxidation reaction must be equal to the number of electrons acquired in the reduction phase. This is the key to balance the equations for Redox reactions. To keep track of electrons, it is convenient to write oxidation and reduction reactions as semi reactions. The half reactions for equation 1 are shown below. In this example, zinc loses two electrons and copper (II) accepts both. (2) ZN ã ¢ â € â € â € â € ™ ZN2 + 2 eã ¢ ë † â € Â (half oxidation reaction, reduction of the agent) ã ¢ (3) Cu2 + + 2 eã ¢ ë † â € Â € â € ™ Cu (half a reduction reaction, oxidant agent) is in a (slightly) more complicated example, the copper metal transfers the e -ions electrons, which have a state of oxidation of +1. The half reactions and the balanced net equation are shown below. The number of lost electrons must be the same as the number of electrons earned, two silver ions each accept an electron from a single copper atom, which loses two electrons. (4) Cu ã ¢ â € â € â € Â € ™ + 2 eã ¢ ë † '(half oxidation reaction) ã ¢ (5) AG + + 1 eã ¢ ë † â € â € â € â € ™ AG (reduction half reaction) ã ¢ (6) 2 ag + + cu ã ¢ â € 2 ag + cu2 + (net reaction) in this example, the copper gives electrons (it is oxidized). Cié indicates The silver ion has a vacant orbital to a lowest energy of the one in which two copper electrons reside. In Redox reactions, oxidate and e e The shapes of each reactor are called a Redox couple. Red couples are written "OX/RED". The oxidized form of the couple is shown to the left, the shape reduced to the right with a slash in the middle. For example, Cu2+/Cu and ZN2+/ZN. In part of this experiment, the relative strengths of oxidizing agents and reducing are positioned by observing whether the reactions occur or not. A visible change accompanies each reaction. A solid or gas is formed, or a change of color is occurred. Cié indicates that the orbitals not filled in the oxidant agent are lower energy than the orbitals filled with the reduction agent. The reaction is the result of the transfer of electrons. If such a change is not observed, no reaction occurs. You will be tested three oxidizing agents, Cu2+, MG2+ and Mno4-, to determine their relative reactivation. The solutions that these ions will provide are Cu (NO3) 2, MG (NO3) 2 and KMNO4, respectively. The half -reduction reaction for each oxidizing agent is shown below in alphabetical order. (7) CU2 + (AQ) + 2 E-CU (S) (8) MG2 + (AQ) + 2 E-MG (S) (9) MNO4- (AQ) + 8 H + (AQ) + 5 E-MN2 + (aq) + 4 h2o (l) you will react each of them with two compounds that can act as reducing agents, hydrogen peroxide (H2O2) and potassium iodo (KI). Therefore, three reduction agents, Cu (S), MG (S) and ZN (S) will then be tested to determine their relative reactivations. The reaction oxidation for each reduction agent is listed below in alphabetical order. (10) CU2 + (AQ) + 2 E- (11) MG (s) MG2 + (AQ) + 2 E- (12) ZN2 + (AQ) + 2 you will react each of them with two species that can act as oxidant agents , water (H2O) and hydronio ion (H3o+) supplied by hydrochloric acid. Note that the CU2+/Cu couple and the ZN2+/ZN couple are also examined in part B of this experiment. Get ready to compare the relative reactivations of part A with your observations from the measure of potential cell phones in part B. When electrons are transferred spontaneously (Downhill) (Downhill) Âras arusim is ehc elaiznetop aznereffid amirp aL .enoizudir id etnega'l e etnadisso'l art elaiznetop aznereffid al erarusim ²Âup is ,ocirac emoc otazzilitu eneiv ortemtlov nu odnauQ .ellecimes eud el eragelloc rep otazzilitu eneiv ,artla'lla allec azzem anu ad eraiggaiv id inoi ilga etnesnoc ehc ,elas id etnop nu ,otiucric li eratelpmoc reP .odotac la etnadisso etnega'llen aigrene assab a ilatibro ilga ,onretse otiucric li osrevartta ,odona'lla etnecudir etnega'llen aigrene atla da ilatibro ilgad onaiggaiv inorttele ilG .ortemtlov nu Âras ocirac li ,enoizartsulli'llen emoC .onretse otiucric li amrof ocirac nu osrevartta idorttele ilg eragelloC .odona'l otamaihc ¨Ã enoizadisso'l eneivva iuc a odorttele'l e odotac li otamaihc ¨Ã enoizudir al acifirev is iuc a odorttele'L .idorttele etamaihc onos ehcillatem ecsirts eL .etnednopsirroc ocillatem enoi led enoizulos anu ni ollatem led aicsirts anu onognetnoc ehc isav onos ellecimes el ,acinavlag allec anu nI .noI ocniz e ocillatem emar art enoizaer al rep acimihcortele allec :2 arugiF .ottos iuq 2 arugif allen otartsom ¨Ã onU .acimihcorttele allec anu ni otiugese etnemacipit eneiv otseuQ .orol id art aigrene id eznereffid el erarusim e xoder eippoc id eires anu Ârinu iS .etnadisso etnega nu id ilatibro ilg e enoizudir id etnega nu id irotanod ilatibro ilgen inorttele ilg art aigrene id azneraffid al erarusim id ehcna etnesnoc Âtem a inoizaer elled enoizarapes aL .)3O2lA(elarenim ous lad oinimulla id ollatem id enoizudorp al ¨Ã etnatropmi oipmese nU .isilorttele'l onatropmoc ilairtsudni issecorp itloM .atazzirosnops non enoizerid allen xoder id enoizaer anu eradiug rep)aigrene id etnof(anretse enoisnet anu atazzilitu eneiv iuc ni ,acitilorttele allec anu eratsopmi elibissop ehcna Ã .ehcinavlag ellec itamaihc onos ivitisopsid ilaT .eirettab el onanoiznuf emoc occE .itrapmoc isrevid ni etarapes onos inoizaer ezzem el es onretse otiucric nu ni eraroval onossop ,)arebil aigrene The CU2+/Cu couple and the AG+/AG couple. You will use this to set your yours so you get a positive reading. Recall from equations 4 - 6 that copper metal gives electrons to silver ions. The metallic copper is oxidized in this reaction, so the pair Cu2+/Cu is the anode. The silver is reduced, so the Ag+/Ag pair is the cathode. The electrons travel towards the cathode, the most electrically positive electrode, in a spontaneous reaction. The potential difference, Ecell, is defined as (13) Ecell = Ecathode − Eanode In a galvanic cell, the cell potential must be positive if the cathode and the anode are properly identified. The potential difference between the Cu2+/Cu pair and several other pairs of curls, consisting of metals and their ions. One of the pairs will be Zn2+/Zn. From equations 1 - 3, we know that copper (II) is reduced in this reaction, so the pair Cu2+/Cu is the cathode. However, when the Cu2+/Cu pair is connected to the Ag1+/Ag pair, the Cu2+/Cu pair is the anode. What effect will it have on the measure? If the Cu2+/Cu pair is kept in the same terminal as the voltmeter for all measurements, those in which the cathode will show potential negatives. This simply indicates that the electrons travel through the voltmeter in the opposite direction from what was measured in the cell with the Ag+/Ag pair. The voltmeters are sensitive to the direction of the electron flow (electric current), and indicate the direction by means of the sign on the potential difference. Therefore, with this experimental configuration, a positive tension means that the Cu2+/Cu pair is the anode, and a negative tension means that the Cu2+/Cu pair is the cathode. So, you should get a number of potential differences that can be arranged by most negative to most positive. This order will tell you the energy relations between orbitals filled in metals and orbital vacancies in ions. The couple producing the difference avitagen avitagen ¹Âip Copper will have metal with the highest energy electrons. It'll be the strongest reducing agent. The couple producing the most positive potential difference with copper will have unfilled orbitals of lower energy. It'll be the strongest oxidant agent. For part B, you will use a simple version of an electrochemical cell. It will consist of a round plastic base with a central recess flanked by a porous omelet containing the solution of the salt bridge and the recesses around the circumference for the various half-cell solutions. The metallic electrodes are wires that will be inserted in the solutions containing metallic ions. When the voltmeter cables are connected to the two metal electrodes, the potential difference between the two cells will be measured as in Figure 2 above. ceramic plate 30 ml water bottled beacher deionized microlab multi-echem interface cell module microlab voltmeter clip ~ 6 drops 0.1 m Cu (NO3) 2 ~ 6 drops 0.1 m mg (NO3) 2 ~ 6 drops 0.1 m mg (NO3) 2 ~ 6 drops 0.1 m kmno4 (Acid) ~ 9 drops 3% H2O2 Solution ~ 9 drops 0.1 M ki ~ 9 drops Phenolftalein Solution ~ 2 pieces Cu Metal ~ 2 pieces Zn metal ~ 2 pieces metal mg ~ 20 ml 3 m hcl ~ 30 ml tap water 0.1 m Cu (NO3) 2 0.1 M AgNO3 0.1 M Pb (NO3) 2 0.1 M Zn (NO3) 2 0.1 M KNO3 2 ã—~ 1.5" copper wire ~ 1.5" silver wire ~ 1.5" lead wire ~ 1.5" zinc wire Potassium permanganate solution is strong (KM) It is also acid and corrosive. The HCl 3M solution is acid and corrosive. Both solutions can attack the skin and cause permanent damage to the eyes. If one of these solutions pops into your eyes, use the eyewash immediately. Keep your eyes open and flush with water. If you experience contact with skin or clothing, rinse the affected area with water. Ask your laboratory partner otal otal lus imuf id onafoc len rehceb ia etnematnetta olignuiggA .itnatirri e idica iropav aname M3 LCH'L .aticsuirouf allus erotturtsi out li Avoid inhaling the vapors. Reducing agents produce hydrogen gases if exposed to water and/or acid. Keep the reactions away from the sources of ignition and rinse the acid from the metal before discarding it. Do not limit the waste container strictly. As with all the workshops, be sure to wash your hands thoroughly after handling any chemical and avoiding touching the eyes and mouth during the laboratory. The solutions from part A1 of the experiment should be rinsed in the waste container for oxidizing agents. There is a funnel in the container. Pour the contents of the cockpit plate into the funnel, then rinse the dish with water from a bottle of pressing. The metals of part A2 of the experiment must be removed from the reactions with the pliers, rinsed with water if they have been exposed to acid, stained to remove excess water, then discarded in the container for used metals. Do not limit this container strictly; Hydrogen could increase the pressure in it. The liquids of this experiment can be downloaded in the sink. The solutions from part B of the experiment should be rinsed in the waste container for Redox solutions. There is a funnel in the container. Pour the contents of the cockpit plate into the funnel, then rinse the plastic base with water from a bottle of pressing. Metal cables must be returned to the configuration sheet to be used by the next laboratory section. Complete the prelab Webassign assignment. Check your Webassign account for deadlines. Students who do not complete the Webassign Prelab are required to bring and deliver the prelab worksheet. Laboratory procedure please print the worksheet for this laboratory. You will need this sheet to record your data. Because of this The part in Verrã set at your laboratory station. During the laboratory period, each couple should alternate by going to the lateral shelf to record the measurements for part B. 1 Get a ceramic cockpit plate. 2 Add 3 drops of Cu solution (NO3) 2 to the first well, 3 drops of mg (NO3) 2 solution to the second second and 3 drops of solution KMnO4 to the third well. 3 Add 2 drops of H2O2 solution to each well. If something happened, write "R" (reaction) in the Data Table A1 and make a brief note of what happened in the space below. If nothing happened, write "NR" (no reaction) in space. Any oxidizing agent that reacted with H2O2 is a stronger oxidizing agent than any that did not. 4 If no reaction has been observed, place three drops of the oxidizing agent in another well. 5 Add three drops of solution KI to each well. If something happened, write "R" (reaction) in the Data Table A1 and make a brief note of what happened in the space below. If nothing happened, write "NR" (no reaction) in space. Any oxidizing agent that reacted with the KI is a stronger oxidizing agent than anyone who did not. 6 Pour the plate content well into the waste bottle for oxidizing agents and rinse it with your squirt bottle. Rinses should also enter the bottle of waste. Pour the plate content well into the waste bottle for oxidizing agents and rinse it with your squirt bottle. Rinses should also enter the bottle of waste. Table A: Reactions of oxidizing agents 1: Lists oxidizing agents in order, from weaker to stronger. Question 2: Write half reactions for oxidizing agents in order, from weaker to stronger. (Hint: Remember that oxidizing agents are reduced.) 1 Get three 30 mL beakers and label them Cu, Mg and Zn. 2 Add 10 - 15 mL of tap water to each, then place a small piece of copper metal in a called "Cu", magnesium metal to the labeled "Mg" and zinc metal to the labeled "Zn". 3 For each beaker, add 3 drops of phenolophthalein indicator.Something happened, write "r" (reaction) in the A2 data table and make a short note of Cié that took place in the space below. If nothing happened, write "nr" (no reaction) in space. Any reduction agent that reacted with water is slower ¹Âip elaiznetop li ah etrof ¹Âip etnecudir etnega'l e ovitisop ¹Âip elaiznetop li aibba etrof ¹Âip etnadisso etnega'l ehc ecid iS :5 adnamoD).itadisso onognev itnecudir itnega ilg ehc adrocir :otnemireggu S(.etrof ¹Âip la ilobed ¹Âip iad ,enidro ni itnecudir itnega ilg rep inoizaer ezzem el ivircS :4 adnamoD .ilobed ¹Âip la itrof ¹Âip iad ,enidro ni itnecudir itnega ilg eracnelE :3 adnamoD itnecudir itnega ilged inoizaeR :2A itad id allebaT .atavort iah'l iuc ni enoizarugifnoc id aera'llen alratropir e erutazzertta eut el ettut eraguicsa e eravaL 9 .auqca noc onidnaval li ognul itacirac s eresse onossop idiuqil I .otasu ollatem id olottarab len ilitteM .eraguicsa e arutimerps id ailgittob anu ad atazzinoied auqca noc ilrauqcaics ,rehceb ied onucsaic ad illatem i erevoumir ,ituifir ied olottarab la oniciv etinrof eznip el noC 8 .ottaf ah ol non ehc olleuq id etrof ¹Âip etnecudir etnega nu ¨Ã odica'l noc otigaer ah ehc etnecudir etnega isaislauQ .oizaps ollen)enoizaer anussen("RN" ivircs ,allun osseccus ¨Ã non eS .etnatsottos oizaps ollen otudacca ¨Ã ehc ²Âic id aton everb anu idnerp e 2A itad ied allebat allen)enoizaer("R" ivircs ,asoclauq osseccus ¨Ã eS .rehceb nucsaic a lCH enoizulos id m 3 id lm 01 ignuigga e elaffacs imuf onafoc la iaV 7 .rehceb nucsaic a ottenibur id auqca id lm 01 acric ignuiggA 6 .itattehcite etnematterroc rehceb ien auqca'l noc ecsigaer non ehc illatem id enoipmac ovoun nu eranoizisop idniuq ,rehceb i eraguicsa e erauqcaicsiR 5 .auqca noc onidnaval li ognul itaciracs eresse onossop idiuqil I .otasu ollatem id olottarab len ollatem li eranoizisop ,enoizaer anu atacifirev ¨Ã is eS .5 oiggassap len otazzilitu eresse ²Âup ollatem otseuQ .eraguicsa per atrac id oloilgavot nu us olranoizisop e atazzinoied auqca noc ollatem li erauqcaics ,enoizaer anucla atacifirev ¨Ã is non eS .rehceb ert ied onucsaic ad illatem i erevoumir ,ituifir ied olottarab lad etinrof eznip el noC 4 .on ehc ortla isaislauq id etnega asoc asoc rep enoizaer azzem anu ivircS b ?oisengam li otigaer ah enoi o otnemele ,otsopmoc elauq noc a .oisengam id ollatem li eglovnioc ehc enoizaer al aredisnoc :6 adnamoD .avitisop ¹Âip a avitagen etrap roiggam allad enidro ni)inoizudir emoc(inoizaer ezzem el ettut acnele ,inoizavresso elled esab allu S To this chemist. It is possible to use a table of standard reduction potentials for help. C Writing the balanced equation for the reaction that has occurred between the magnesium metal and this chemical. Question 7: You have also observed a reaction with zinc metal. A with which compound, element or ion reacted zinc? b) b) b Scrivi una mezza reazione per quello che Ã¨ successo a questa sostanza chimica. It is possible to use a table of standard reduction potentials for help. C Writing the balanced equation for the reaction that has occurred between the zinc metal and this chemical. Question 8: On the basis of your answers to application 5, or will these combinations produce a reaction? 1 To activate the Microlab Voltmeter, first make sure that the MicroLab interface is activated, as indicated by a green light in the "or" of the MicroLab logo. On the computer desktop, double click on the MicroLab icon to open the software. A box seem to choose an experiment. He highlights "Half-Cell Metter" and click on "OK". Make sure that the voltage entry is selected and click "OK". This brings the display of the measured voltage meter. 2 Fill the center of the cell, shown in figure 3, with fresh kno3 solution. 3 Fill the wells with metal ions solutions and place the corresponding metal wire in the solution: well 1 and 2: Cu (NO3) 2/Cu. thread Cu have a characteristic copper color. Well 3: ZN (NO3) 2/ZN. The ZN wire will be gray and difficult to fold. Well 5: PB (NO3) 2/pb. The pb wire will be opaque gray and very foldable. Well 7: Agno3/AG. The AG thread will be shiny and seem silver. Figure 3: MIGROLAB MULTI-ECHEM METH module 4 for the remedial cell, attach the black alligator clip to the copper wire in good 1. 5 Next connect the red alligator clip to the other copper wire in Pozzo 2. 6 Measuring the potential of the Volt and record it in the B1 data table. This value should be very close to 0.0 V and there is no potential difference between copper and itself. If you can't find this result, result, your instructor. 7 When you are finished taking your measurement, remove the red lead from the copper wire and attach it to the silver wire. Measure the potential in volts and record it in Data Table B1. The Silver-Copper cell should have a positive cell potential. If it does not, consult your instructor. 8 Repeat step 7 for the Zinc-Copper and Lead-Copper couples. 9 When finished, dispose of all waste in the appropriate container in the hood, rinse the cell, and refill the center cell with KNO3 solution. 10 Enter the four couples into Data Table B2, arranging them in order from most negative potential to most positive potential. 11 We have treated the Cu2+/Cu couple as a reference point for our measurements. However, the standard hydrogen electrode (SHE) is defined by international convention as the zero volt reference. The reduction potential of Cu2+/Cu is +0.34 V relative to this standard. Therefore by adding +0.34 V to each of the potentials you measured vs Cu2+/Cu will convert them to potentials vs SHE. Enter these values in Data Table B2, column 3. 12 Refer to the table of Standard Reduction Potentials given on the inside front cover of this lab manual to find the actual standard reduction potentials of these four couples. Enter these values in Data Table B2, column 4. Data Table B1: Cell Potentials vs a Cu2+/Cu Couple Data Table B2: Cell Potentials in Order, with Half-Reactions Question 9: Based on the order obtained by experiment, a Which species has the highest energy filled or partially filled orbitals? b Which species has the lowest energy unfilled or partially filled orbitals? c Which species is the strongest reducing agent? d Which species is the strongest oxidizing agent? Question 10: Using the order you found in Data Table B2 for the cell potentials, write the half-reaction for each half-cell. Write the reactions as reductions. Question 11: The Mg2+/Mg couple was not tested when measuring half-cell Based on your behavior in part A, where would it put it in the B2 data table? (If you are doing first part B, go back to this question after completing both parts of the laboratory. 13 before leaving, go to a computer in the laboratory and enter your results in the in-Lab assignment. If all the results are marked As correct, disconnect. If not all the results are correct, try to find the error or consult your laboratory instructor. When all the results are correct, note them and exit Webassign. The in-Lab assignment must be completed by The end of the laboratory period. If a further time is required, consult your laboratory instructor. Instructor.

Understanding your money management options as an expat living in Germany can be tricky. From opening a bank account to insuring your family’s home and belongings, it’s important you know which options are right for you. For any academic help you need, feel free to talk to our team for assistance and you will never regret your decision to work with us. We are reliable and established. You can entrust all your academic work to course help online for original and high quality papers submitted on time. We have worked with thousands of students from all over the world. Get 24/7 customer support help when you place a homework help service order with us. We will guide you on how to place your essay help, proofreading and editing your draft – fixing the grammar, spelling, or formatting of your paper easily and cheaply. general-chemistry.pdf Password requirements: 6 to 30 characters long; ASCII characters only (characters found on a standard US keyboard); must contain at least 4 different symbols; Education for Ministry. Education for Ministry (EfM) is a unique four-year distance learning certificate program in theological education based upon small-group study and practice.

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