

Oxidation-Reduction Reactions Pre-lab

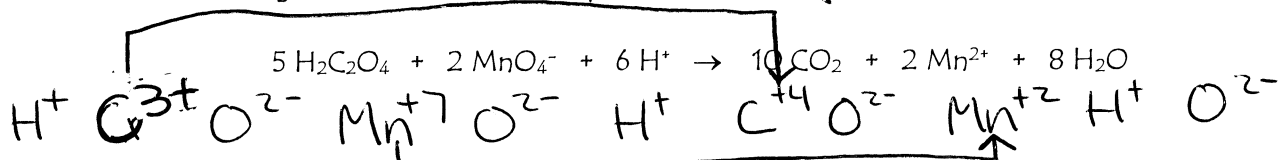
This pre-lab assignment is due at the beginning of the lab session in which you will perform the Oxidation-Reduction Lab. Read the corresponding chapter in our class text and the discussion below to help you answer the following questions.

This assignment is worth three points. The entire lab is worth 10 points - 3 points for the pre-lab and 7 points for the rest of the lab.

1. What is the definition of term 'oxidation number'?

The charge an atom in a cpd would have if the e⁻ pairs in each covalent bond belonged to the more EN atom.

2. Use the following reaction to answer the questions below.



a) Assign an oxidation number to each atom in the reaction.

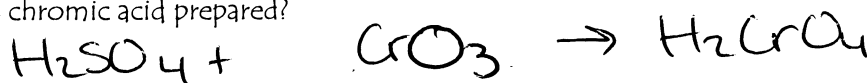
GER reduced

b) Indicate which reactant is oxidized and which reactant is reduced.

c) Which reactant is the reducing agent?

3. The following questions are about the chromic acid reagent:

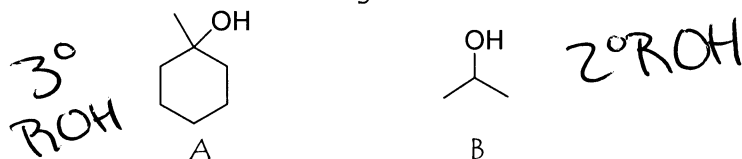
a. How is chromic acid prepared?



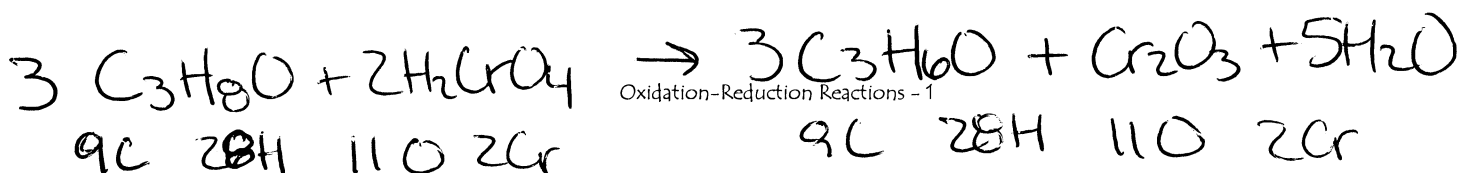
b. Describe the color change involved with the use of this reagent and the chemical basis for the color change.



c. Which of the following alcohols will react with the chromic acid reagent?



d. Write a complete and balanced equation for the reaction of the alcohol above that reacts with chromic acid using skeletal-line structures. You can use the generic reaction in your lab as a guide.



4. What reagent is used to test for a phenol and what does a positive result look like?

Fe^{3+}
yellow

Fe^{3+} w/ phenol = purple

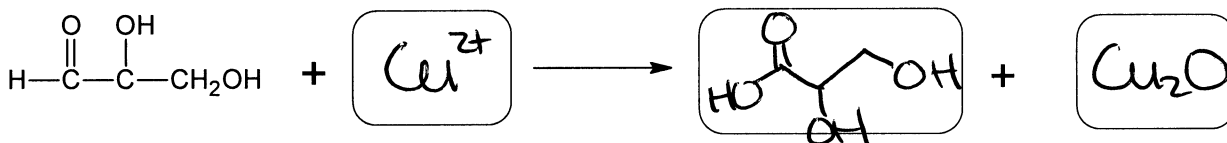
5. Indicate which of the following carbohydrates are monosaccharides? It may be helpful to look in the chapter about carbohydrates.

<input checked="" type="checkbox"/>	glucose	} disaccharides
<input checked="" type="checkbox"/>	fructose	
<input checked="" type="checkbox"/>	galactose	
<input type="checkbox"/>	maltose	
<input type="checkbox"/>	lactose	} polysaccharide
<input type="checkbox"/>	sucrose	
<input type="checkbox"/>	starch	

6. Which functional group of the monosaccharides is oxidized by the Benedict's reagent?

aldehyde

7. What is the oxidizing agent in the Benedict's test? Write the reaction that it undergoes using glyceraldehyde as the monosaccharide.




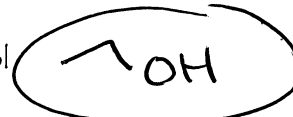
8. Classify each of the following alcohols as primary, secondary, tertiary, or phenol.

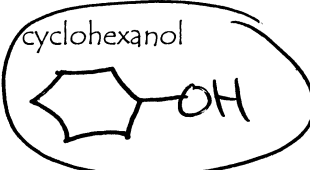
a)  2° ROH

b)  1° ROH

c)  phenol

9. Which alcohol would you expect to be more soluble in water? Explain your reasoning.

a)  or ethanol  less non-polar carbons

b) 1-hexanol or  non-polar carbons are tied up in a ring so the "O-H" group is more accessible to H₂O