### Unit 3 Learning Outcomes Chem 1010

### 3A: Salts

You should be able to:

- Give a variety of similarities and differences between table sugar and table salt.
- Give the number of protons and electrons if given an ion.
- Explain how metals and nonmetals transfer electrons to form compounds, and how this explains the octet rule.
- Recognize compounds which are likely to be colored.
- Recognize main group vs transition metal cations, and simple vs polyatomic ions.
- Predict the charges on main group metal ions and nonmetal ions using the Periodic Table.
- Give the formula for an ionic compound if given the name.
- Give the name of an ionic compound if given the formula.
- Give the names, charges, and formulas for carbonate, sulfate, and nitrate ions.

## 3B: Metals

You should be able to:

- Explain how metals differ from other materials we make things out of.
- List some characteristics of metal.
- Explain the difference between pure metals and alloys, and list a few common alloys.
- Explain the difference between alloys and compounds.
- List some products that would not be possible without metal.
- Explain the difference between metals that are found natively and those found as ores.
- Recognize reactions which describe smelting of ores to form metals vs reactions which describe corrosion of metals to form ionic compounds.
- Recognize chemicals which can be used in smelting vs those which cause corrosion.

# 3C: Acids and Bases I

You should be able to:

- Explain what makes a compound an acid or a base.
- List several common acids, and recognize the difference between mineral acids and organic acids.
- List several common bases.
- Match the acids and bases described in class with where they are found.
- Give the physical characteristics of acids and bases.
- Explain the difference between strong acids and weak acids, and likewise between strong bases and weak bases.
- Tell which acids are strong and weak and which bases are strong and weak.

## 3D: Acids and Bases II

You should be able to:

- Explain how the pH scale is used to measure how acidic or basic a solution is.
- Explain the difference between how strong an acid or base is and how concentrated a solution is, and how both of these things contribute to pH.
- Explain how to determine pH.
- List some natural indicators.
- When given the results of litmus or pH paper, determine the approximate pH of a solution.
- Explain what happens when an acid and a base react with each other.
- Recognize neutralization reactions shown in class.
- Explain what happens when acids react with metals.

## 3E: Plastics I

You should be able to:

- Explain what a polymer is, and what a monomer is, and how they compare to other molecules in size.
- Explain what a copolymer is, and be able to recognize polymers which are and are not copolymers.
- List 3 kinds of natural polymers, and what monomers are used to make them.
- List some of the many advantages of plastic, which explains why we use it so much.
- Explain the difference between condensation polymers and addition polymers, and recognize examples of each.
- Describe the reaction which joins monomers together in polyamide polymers like nylon and kevlar.
- Match nylon, kevlar, and polyester with their characteristics and uses.
- Draw condensation polymers when given monomers.
- Draw monomers when given condensation polymers.

## 3F: Plastics II

You should be able to:

- Explain how addition polymers are formed.
- Draw line structures of addition polymers when given monomers.
- Draw monomers when given line structures of addition polymers.
- Match addition polymers with their uses.
- Explain what cross-linking is and how it affects the properties of polymers.
- Explain what plasticizers are, and what happens when they leak out of polymers.
- Explain three disadvantages of plastics, and how recycling can help remedy one of them.