# Chapter 3: Atomic Structure and the Periodic Table

## September 2, 2014

Objectives

1. Summarize the experimental basis for the discovery of charged particles and the nucleus.
2. Describe subatomic particles and how they are arranged in the internal structure of the atom.
3. Describe the basic properties of protons, neutrons, and electrons
4. Calculate the number of protons, neutrons, and electrons in any atom.
5. Distinguish among atoms, ions, and isotopes.
6. Describe isotopes of an element and how they affect physical and chemical properties.
7. Describe how an average atomic mass of an element in the periodic table is calculated.

Activities

1. TTW lecture on chapter 3, sections 1-3 of the text, enhancing the lecture with the PowerPoint provided on Moodle to the students.
2. TLW take notes on the presentation.
3. TTW work the example problems in the book on the board.
4. TLW participate in a class activity where the students are answering problems from the end of the chapter as part of a group discussion (1, 2, 5, 7, 13, 15, 21, 23, 27, 33)
5. TLW complete a set of assigned practice problems independently from the end of the chapter (3, 4, 6, 8, 9, 14, 16, 18, 22, 24, 28, 34, 38).

## September 3, 2014

Objectives

1. Describe periodic law and how Mendeleev constructed the periodic table from the elements.
2. Describe the modern periodic table and the groups and periods within the table.
3. Describe the location of metals, metalloids, and nonmetal s on the periodic table.
4. State the basic postulates of Bohr’s theory.
5. Describe the first model, the Bohr model of arrangement of electrons in shells around the nucleus of an atom.
6. Describe how Bohr’s theory and the more sophisticates “wave-mechanical” approach are similar and different.
7. Describe the extension of shell model to include sub-shells and orbitals.

Activities

1. TTW lecture on chapter 3, sections 4-6 of the text, enhancing the lecture with the PowerPoint provided on Moodle to the students.
2. TLW take notes on the presentation.
3. TTW work the example problems in the book on the board.
4. TLW participate in a class activity where the students are answering problems from the end of the chapter as part of a group discussion (41, 43, 45, 57, 59, 69, 73)
5. TLW complete a set of assigned practice problems independently from the end of the chapter (42, 44, 46, 47, 50, 54, 58, 60, 70, 72, 74).

## September 4, 2014

Objectives

1. Summarize the experimental basis for the discovery of charged particles and the nucleus.
2. Describe subatomic particles and how they are arranged in the internal structure of the atom.
3. Describe the basic properties of protons, neutrons, and electrons
4. Calculate the number of protons, neutrons, and electrons in any atom.
5. Distinguish among atoms, ions, and isotopes.
6. Describe isotopes of an element and how they affect physical and chemical properties.
7. Describe how an average atomic mass of an element in the periodic table is calculated.
8. Describe periodic law and how Mendeleev constructed the periodic table from the elements.
9. Describe the modern periodic table and the groups and periods within the table.
10. Describe the location of metals, metalloids, and nonmetal s on the periodic table.
11. State the basic postulates of Bohr’s theory.
12. Describe the first model, the Bohr model of arrangement of electrons in shells around the nucleus of an atom.
13. Describe how Bohr’s theory and the more sophisticated “wave-mechanical” approach are similar and different.
14. Describe the extension of shell model to include sub-shells and orbitals.

Activities

1. TLW complete a quiz in which they must summarize the experimental basis for the discovery of charged particles in the nucleus, describe subatomic particles, determine the number of particles in an atom, describe isotopes, describe the structure of the periodic table, including the location of metals, nonmetals, metalloids, halogens, alkali metals, alkaline earth metals, and the difference between groups and periods.
2. TTW facilitate a discussion in which students ask for clarification on any part of the quiz they may or may not have understood.

## September 5, 2014

Objectives

1. Describe how you obtain atomic electronic configurations for elements from the periodic table.
2. Describe how you obtain ionic electronic configurations for elements from the periodic table.
3. Describe how you obtain atomic and ionic valence shell electron configurations and orbital diagrams.
4. Describe how valence electron configurations are related to periodic law and arrangement of elements in the periodic table.
5. Use the periodic table to obtain information about an element.
6. Describe the classification of elements in the periodic table as representative elements, transition elements, and inner transition elements.

Activities

1. TTW lecture on chapter 3, sections 7-9 of the text, enhancing the lecture with the PowerPoint provided on Moodle to the students.
2. TLW take notes on the presentation.
3. TTW work the example problems in the book on the board.
4. TLW participate in a class activity where the students are answering problems from the end of the chapter as part of a group discussion (75, 77, 79, 81, 83, 85, 89, 91, 93, )
5. TLW complete a set of assigned practice problems independently from the end of the chapter (76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 100, 102, 104).

## September 8, 2014

Objectives

1. Summarize the experimental basis for the discovery of charged particles and the nucleus.
2. Describe subatomic particles and how they are arranged in the internal structure of the atom.
3. Describe the basic properties of protons, neutrons, and electrons
4. Calculate the number of protons, neutrons, and electrons in any atom.
5. Distinguish among atoms, ions, and isotopes.
6. Describe isotopes of an element and how they affect physical and chemical properties.
7. Describe how an average atomic mass of an element in the periodic table is calculated.
8. Describe periodic law and how Mendeleev constructed the periodic table from the elements.
9. Describe the modern periodic table and the groups and periods within the table.
10. Describe the location of metals, metalloids, and nonmetal s on the periodic table.
11. State the basic postulates of Bohr’s theory.
12. Describe the first model, the Bohr model of arrangement of electrons in shells around the nucleus of an atom.
13. Describe how Bohr’s theory and the more sophisticated “wave-mechanical” approach are similar and different.
14. Describe the extension of shell model to include sub-shells and orbitals.
15. Describe how you obtain atomic electronic configurations for elements from the periodic table.
16. Describe how you obtain ionic electronic configurations for elements from the periodic table.
17. Describe how you obtain atomic and ionic valence shell electron configurations and orbital diagrams.
18. Describe how valence electron configurations are related to periodic law and arrangement of elements in the periodic table.
19. Use the periodic table to obtain information about an element.
20. Describe the classification of elements in the periodic table as representative elements, transition elements, and inner transition elements.

Activities

1. TTW facilitate a review session in which students are answering OWL questions on the promethean board in teams.
2. TLW compete in a review game against other teams by completing questions on the promethean board.
3. TTW answer any questions about the material students may have.

## September 9, 2014

Objectives

1. Summarize the experimental basis for the discovery of charged particles and the nucleus.
2. Describe subatomic particles and how they are arranged in the internal structure of the atom.
3. Describe the basic properties of protons, neutrons, and electrons
4. Calculate the number of protons, neutrons, and electrons in any atom.
5. Distinguish among atoms, ions, and isotopes.
6. Describe isotopes of an element and how they affect physical and chemical properties.
7. Describe how an average atomic mass of an element in the periodic table is calculated.
8. Describe periodic law and how Mendeleev constructed the periodic table from the elements.
9. Describe the modern periodic table and the groups and periods within the table.
10. Describe the location of metals, metalloids, and nonmetal s on the periodic table.
11. State the basic postulates of Bohr’s theory.
12. Describe the first model, the Bohr model of arrangement of electrons in shells around the nucleus of an atom.
13. Describe how Bohr’s theory and the more sophisticated “wave-mechanical” approach are similar and different.
14. Describe the extension of shell model to include sub-shells and orbitals.
15. Describe how you obtain atomic electronic configurations for elements from the periodic table.
16. Describe how you obtain ionic electronic configurations for elements from the periodic table.
17. Describe how you obtain atomic and ionic valence shell electron configurations and orbital diagrams.
18. Describe how valence electron configurations are related to periodic law and arrangement of elements in the periodic table.
19. Use the periodic table to obtain information about an element.
20. Describe the classification of elements in the periodic table as representative elements, transition elements, and inner transition elements.

Activities

1. TLW complete a test on chapter 3, covering all the objectives taught.

## September 10, 2014

Objectives

1. Review information learned from chapters 1-3.

Activities

1. TLW review information covered in chapters 1-3 of the text in preparation for the Louisiana Tech online exam.
2. TTW answer any questions that the students may have about past material.

## September 11, 2014

Objectives

1. Demonstrate knowledge of material from chapters 1-3 of the text.

Activities

1. TLW complete a test on chapters 1-3 on Moodle.