

SUBJECT	: Chemistry	LEVEL/SEMESTER	: (VII / 2)
TOPIC	: Chemical Bonds	SCHOOL YEAR	: 2017 - 2018
GOALS	: Students able to explain what holds the particles together in elements and compounds and the reason for their formulae	NUMBER OF MEETINGS	: (2 x 40 min.)
CHRISTIAN WORLDVIEW:			
Through Him all things were made; without Him nothing was made that has been made. – John 1:3			
O LORD, what a variety of things You have made! In wisdom You have made them all. The earth is full of Your creatures. – Psalm 104:24			

(1st Meeting, January 4, 2018 & January 5, 2018)

SUB-TOPIC	: Force holding particles and Ionic Bonds
OBJECTIVES	: Students will understand about force holding particles and ionic bonds
INDICATORS	: Students are able to : <ul style="list-style-type: none"> • describe the formation of ionic bonds between metals and non-metals • state that ionic materials contain a giant lattice in which ions are held together by electrostatic forces • deduce the formulae and names of ionic compounds

**TEACHING
PROCEDURE**

:

1. Elicitation/Ice Breaker

- Linking students' new and old information by showing samples of the elements and compounds as well as the models shown in Figure 6.1 on page 84 of the Textbook and discussing Skills Practice questions number 1a on page 85 of the Textbook.

2. Presentation and Discussion

- By using power point, students discussing questions such as “What is a chemical bond?, How are atoms held together?, What kinds of bonds are there?” and referring it to page 84 – 85 of the Textbook and discussing Skills Practice questions number 1b, 2, and 3 on page 85 of the Textbook to introduce the idea of a chemical bond as part of the inquiry preview.
- After discussing formation of ionic bonds, students draw the electronic structures of ionic compounds and visualize ionic bonds formation by watching ionic bonding simulations. Students point out the rows of sodium and chloride ions by a model of sodium chloride structure (Figure 6.5 on page 97 of the textbook and simulation of sodium chloride structure).
- Understanding the colors in gemstones produced by ions using examples of colored solutions of compounds with the ions in Figure 6.6 and in video.
- Students link the formation of simple ions with the gain or loss of outer shell electrons. The names of simple negative ions end in -ide.
- Students will have to accept the structures for polyatomic ions.
- Students reading and pronouncing the names of ions correctly (revise the notes on the naming of compounds in Section 4.3 on pages 56 of the Textbook).

3. Practice/Production

Checking students' understanding of key concepts that have been learnt in this meeting by using the Skills Practice questions on page 87 (number 1 and 4a-4c) and 89 (number 2; 3; and number 4a, c, d, e, f) (DA – individual homework).

4. Review/Conclusion

- The force holding particles together is called a chemical bond.
- Atoms of metals lose electrons to form positive ions. Atoms of non-metals gain electrons to form negative ions. A strong electrostatic force of attraction between the oppositely charged ions holds them together. This force of attraction is called an ionic bond. An ionic bond is the force of attraction between oppositely charged ions in a compound.
- To work out the formula of an ionic compound, the positive and negative charges in the compound must balance.

	<ul style="list-style-type: none"> Students conclude concepts that have been learnt in this meeting by understanding the Concept Link on page 97 of the textbook
RESOURCES	: All About Chemistry ‘O’ Level, visionlearning.com/library/module_viewer.php?c3=&mid=55%20 , video simulations, and power point

(2nd Meeting, January 11, 2018 & January 12, 2018)

SUB-TOPIC	: Formation of Covalent Bonds, Giant Molecular Structures, and Formation of Metallic Bonds
OBJECTIVES	: Students will understand about covalent bonds, giant molecular structures, and formation of metallic bonds
INDICATORS	<p>: Students are able to :</p> <ul style="list-style-type: none"> describe the formation of a covalent bond by the sharing of electrons describe, with the aid of diagrams, the formation of covalent bonds between non-metallic elements deduce the arrangement of electrons in covalent molecules state the kinds of structures that substances with ionic and covalent bonding have compare the bonding and structures of diamond and graphite describe metals as a lattice of positive ions in a ‘sea of electrons’ define a metallic bond
TEACHING PROCEDURE	<p>:</p> <ol style="list-style-type: none"> Elicitation/Ice Breaker <ul style="list-style-type: none"> Linking students’ new and old information by answering quick quizzes given by teachers (Chapter Review page 98 Self-Management number 4 and Practice number 1) (DA-group homework) Students make group discussion.

	<p>2. Presentation and Discussion</p> <ul style="list-style-type: none"> • Students view a simulation of covalent bonding shown by teacher and discuss formation of covalent bonds on pages 89 – 93 of the textbook also deduce formulae and names for simple covalent compounds. To better understanding students by group discussion discussing “Chemistry Inquiry” page 93 and Skills Practice page 91 number 3. Students understanding the weak forces attraction between covalent molecules (page 94 of the textbook) and discussing Skills Practice page 94 of the textbook number 1, 3, and 4b – 4c. • Students understanding the look of giant molecular structures by reading page 95 - 96 of the textbook and viewing giant molecular structures simulation. • Students understanding the formation of metallic bonds by reading page 96 of the textbook and viewing the animations of metal and metallic bonding structure to give them a good visualization of the structure and of the behavior of the delocalized electrons in a metal. <p>3. Practice/Production</p> <p>Students hand in results of group discussion (Skills Practice of the textbook) and Additional Exercise 3 on Linus Pauling worksheet that has been photocopied and distributed to the class. (DA – Group Homework)</p> <p>4. Review/Conclusion</p> <ul style="list-style-type: none"> • A covalent bond is a bond formed by the sharing of a pair of electrons. In forming covalent bonds, each atom attains the electronic structure of a noble gas. • In the covalent molecules, the atoms are held together by strong covalent bonds. Between the molecules, there’re only weak forces of attraction called intermolecular forces. • Giant molecular structures consist of atoms joined together by covalent bonds. Giant lattice structures consist of metal atoms which are packed together closely in regular three-dimensional patterns. • A metallic bond is the attractive force between positively charged ions and negatively charged free / mobile (delocalized) electrons. The moving electrons are called mobile electrons or delocalized electrons. • Students conclude concepts that have been learnt in this meeting by understanding the Concept Link on page 97 of the textbook
RESOURCES	: All About Chemistry ‘O’ Level, visionlearning.com/library/module_viewer.php?c3=&mid=55%20 (covalent bonding simulation), giant molecular structures simulation, youtube.com/watch?v=c4udBSZfLHY (animations of metal and metallic bonding structure)

(3rd Meeting, January 18, 2018 & January 19, 2018)

SUB-TOPIC	: Force holding particles, Ionic Bonds, Formation of Covalent Bonds, Giant Molecular Structures, and Formation of Metallic Bonds
OBJECTIVES	: Students will understand about force holding particles, ionic bonds, covalent bonds, giant molecular structures, and formation of metallic bonds
INDICATORS	: Students are able to : <ul style="list-style-type: none">• describe the formation of ionic bonds between metals and non-metals• state that ionic materials contain a giant lattice in which ions are held together by electrostatic forces• deduce the formulae and names of ionic compounds• describe the formation of a covalent bond by the sharing of electrons• describe, with the aid of diagrams, the formation of covalent bonds between non-metallic elements• deduce the arrangement of electrons in covalent molecules• state the kinds of structures that substances with ionic and covalent bonding have• compare the bonding and structures of diamond and graphite• describe metals as a lattice of positive ions in a ‘sea of electrons’• define a metallic bond
TEACHING PROCEDURE	: CA
RESOURCES	: Competence Assesment

Semarang, December 20th, 2017

Subject Coordinator

Subject Teacher

.....

.....

Approved by,

Head of Tritunggal

Deputy Head 1

Christian Secondary School

.....

.....

Note:

Times New Roman 12, Space: Single, Before & After: 6, Margins: 2 cm (all sides)