

**Mohamed Khider University of Biskra**  
**Faculty of Exact Sciences and Natural and Life Sciences**

**1<sup>st</sup> year LMD – SNV Biology**  
**Subject: Chemistry 1**

**Academic year: 2023/2024**

**Applied exercises series No. 5**

(Chemical bonds)

**Exercise 1:**

Represent the following molecules using the Lewis diagram and indicate the nature of the bonds formed:

CO<sub>2</sub>, H<sub>2</sub>O<sub>2</sub>, N<sub>2</sub>O<sub>4</sub>, SO<sub>2</sub>, H<sub>3</sub>PO<sub>3</sub>, HClO<sub>4</sub>, H<sub>2</sub>SO<sub>4</sub>, NO<sub>2</sub><sup>-</sup>.

**Exercise 2:**

1. Give Lewis notation of the following molecules and ions:

H<sub>3</sub>O<sup>+</sup>, C<sub>2</sub>H<sub>6</sub>, SF<sub>6</sub>, PCl<sub>3</sub>, PCl<sub>5</sub>, NCl<sub>3</sub>.

2. Which of these compounds do not comply with the Octet rule?

3. Based on the electronic structures of sulphur and phosphorus atoms, explain the formation of SF<sub>6</sub> and PCl<sub>5</sub> molecules.

4. Predict for different phosphorus valences. Both PCl<sub>3</sub> and PCl<sub>5</sub> chlorides exist.

Explain why only NCl<sub>3</sub> is known when NCl<sub>5</sub> does not exist.

**Exercise 3:**

Using the VSEPR method, specify the geometric shape of the following molecules:

SiH<sub>4</sub>, NH<sub>3</sub>, BeCl<sub>2</sub>, and COCl<sub>2</sub>.

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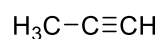
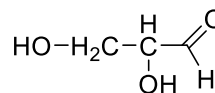
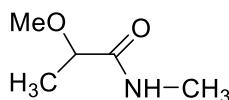
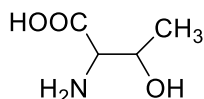
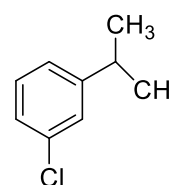
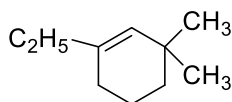
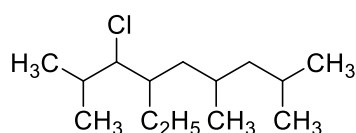
**Academic year: 2023/2024**

**Applied exercises series No. 6**

(Compounds nomenclature)

**Exercise 1:**

According to the official nomenclature, name the following compounds:



**Exercise 2:**

Represent the structures of the following compounds:

- 3-Ethyl-4-Methyl-2-Pentene.
- 5-Propylbenzene-1,3-diol
- Ethyl 5-oxopentanoate
- 3-Chloro-2-aminopropanoic acid
- (E)-5-methylhex-3-enal
- (E)-6-chloro-1,5-dihydroxyhex-3-en-2-one
- 4-(Dimethylamino)butan-2-ol