

EXAM: "Chemical Bonding and Nomenclature" (Batx 1)

Name: _____

Course: _____

1. Examine the next molecules: CO_2 , BF_3 , CH_4 , H_2O , HCN , H_2CO determining the following characteristics:

- the Lewis structure of the molecules
- the shape of the molecules
- the polarity of the molecules
- the intermolecular forces

VALUES OF ELECTRONEGATIVITIES: H=2,1; O=3,5; N=3; B=2; F=4; C=2,5
(3 POINTS)

2. Fill in the gaps in the following table. The table describes the properties of different types of substances.

Example	Type of substance	Melting point	Electric properties	Solubility in water	Mechanical properties
	covalent molecular (polar)				don't fill in this cell
silver (Ag)				no	
CO_2					don't fill in this cell
		high	conductor when melted or dissolved		
C (diamond)			insulator		

NOTES:

In the "example" column, you can write **any compound** or **element** that belongs to the corresponding type of substance

In the "type of substance" column you have to determine if the substance is **ionic** / **metallic** / **covalent molecular** / **covalent network**

In the "melting point" column you have to determine if the substance has **high** / **low** melting point

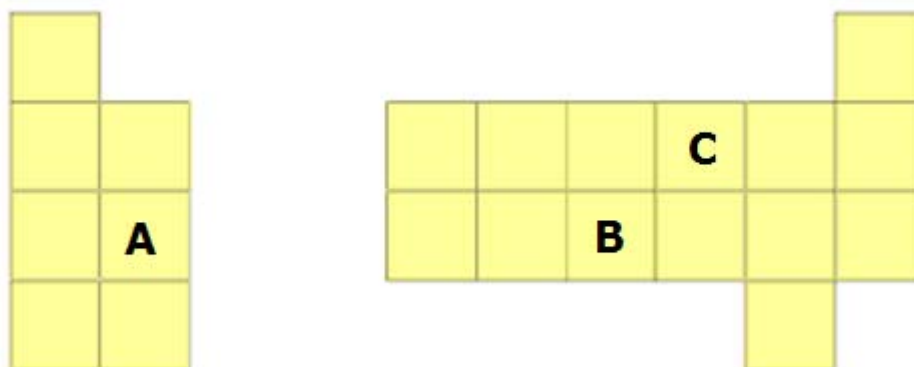
In the "electric properties" you have to decide if the substance is **conductive** / **insulator** / **conductive under special conditions** (in this case, you have to write which are those special conditions)

In the "solubility in water" column you have to determine if the substance dissolves or not: **yes** / **no**

In the "mechanical properties" column you have to determine if the substance is **brittle** / **hard** / **malleable**

(1 POINT)

3. Given the elements A, B, C (those letters are not the real symbols)



- determine the type of compound that results from the combination of A and C. Give the Lewis structure of the compound, the formula and specify the type of substance formed.
- determine all the possible substances that result from the combination of B and C. Give the Lewis structures, formulas and specify the type of substances formed.

(1 POINT)

3. Fill the blanks.
(4 POINTS)

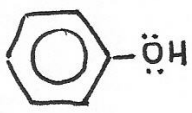
EXERCISE
Fill in the gaps in the following table

Formula	Lewis Structure	Name
$\text{Fe}(\text{OH})_3 \rightarrow$		
$\text{NH}_3 \rightarrow$		
$\text{H}_2\text{SO}_4 \rightarrow$		
		← carbon dioxide
$\text{H}_3\text{PO}_4 \rightarrow$		
$\text{K}_2\text{O} \rightarrow$		
		← iron (II) sulfate
		← calcium sulfite

Formula	Lewis Structure	Name
		← hydrochloric acid
		← aluminum oxide
		← ammonium hydroxide
		← nitric acid
Cl_2O →		
H_2SO_3 →		
$\text{Ca}(\text{NO}_3)_2$ →		
KClO_3 →		
$\text{Mg}(\text{HCO}_3)_2$ →		

Formula	Lewis Structure	Name
H ₂ O →		
HBrO ₄ →		
HF →		
PbO ₂ →		
		← magnesium hydroxide
		← Lithium chloride
		← Sodium (ortho) silicate
KMnO ₄ →		

4. Fill the blanks.
(1 POINT)

Name	Condensed Formula
1,4-pentadiene →	
cyclohexane →	
acetic acid →	
acetone →	
ethyl propanoate →	
←	$\text{CH}_3 - \text{CH}_2 - \underset{\text{CH}_3}{\text{CH}} - \overset{\text{:O:}}{\parallel}{\text{C}} - \text{H}$
←	$\text{CH}_3 - \text{C} \equiv \text{C} - \underset{\text{CH}_3}{\text{CH}} - \text{CH}_3$
←	

Name	Condensed Formula
	$ \begin{array}{c} \text{:}\ddot{\text{Cl}}\text{:} \quad \text{:}\ddot{\text{Cl}}\text{:} \\ \quad \\ \leftarrow \text{CH} - \text{CH} - \text{CH}_2 - \text{CH}_3 \\ \\ \text{:}\ddot{\text{Cl}}\text{:} \end{array} $
	$ \begin{array}{c} \text{:}\ddot{\text{O}}\text{H} \quad \text{CH}_3 \\ \quad \\ \leftarrow \text{CH}_2 - \text{C} - \text{CH} - \text{CH}_2 - \text{CH}_2 - \text{CH}_3 \\ \quad \\ \text{CH}_3 \quad \text{CH}_2 - \text{CH}_3 \end{array} $