

QUESTION (2011:1)

(a) Draw the Lewis structure (electron dot diagram) for each of the following molecules.

Molecule	OCl_2	O_2	CH_3Br
Lewis structure			

(b) Lewis structures for two molecules are given below.

Molecule	HCN	COCl_2
Lewis structure	$\text{H}:\text{C}:::\text{N}:$	$ \begin{array}{c} \text{:}\ddot{\text{Cl}}:\text{C}:\ddot{\text{Cl}}:\text{:} \\ \vdots \\ \text{O} \\ \vdots \end{array} $

For each molecule, name the shape of the molecule and give a reason for your answer.

(i) HCN Shape:

Reason:

(ii) COCl_2 Shape:

Reason:

QUESTION (2010:1)

(a) Draw the Lewis structure (electron dot diagram) for each of the following molecules.

Molecule	Lewis Structure
O_2	
SO_2	
SiCl_4	

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- (b) Lewis structures for three molecules are given below. Complete the table by giving the name of the shape of each molecule.

Molecule	Lewis Structure	Name of shape
CH ₂ Cl ₂	<pre> H :Cl:C:Cl: H </pre>	
NCl ₃	<pre> :Cl:N:Cl: Cl: </pre>	
BF ₃	<pre> F B F \ / \ B / \ F F </pre>	

- (c) The following table shows the Lewis structure and the shape of the molecules for NOCl and H₂S.

	NOCl	H ₂ S
Lewis Structure	<pre> O::N::Cl: </pre>	<pre> H::S::H </pre>
Name of shape	bent	bent

The shape of both molecules can be described as bent. However, these molecules do not have the same bond angle.

Discuss why these molecules have different bond angles.

Your answer must include:

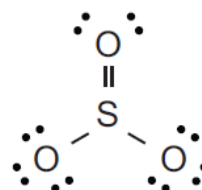
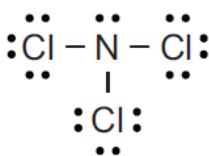
- factors which determine the shape of each molecule
- the approximate bond angle for each molecule.

QUESTION (2009:1)

(a) Complete the table below by:

- (i) Drawing the Lewis structure (electron dot diagram) for each molecule.
- (ii) Drawing a diagram to show the shape of the molecule.
- (iii) Naming the shape of the molecule.

Molecule	Lewis Structure	Diagram of shape	Name of shape
H ₂ O			
CO ₂			
CH ₂ Br ₂			

(b) The Lewis structures of the molecules NCl₃ and SO₃ are given below.

Discuss the shapes and bond angles of these two molecules. For each molecule:

- name the shape
- determine the bond angle
- justify your answers.

QUESTION (2008:1)

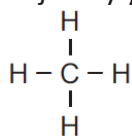
(a) Draw a Lewis structure (electron dot diagram) for each of the following molecules :

Molecule	Lewis structure
Cl ₂ O	
CS ₂	
HCN	

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(b) Lewis structures for TWO molecules are given below. For each molecule :

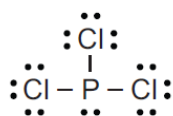
- name the shape
- justify your answer.



(i)

Shape

Justification



(ii)

Shape

Justification

QUESTION (2008:3)

An element, X, has four valence electrons. Another element, Y, has six valence electrons. These elements both combine with oxygen. The molecules formed are XO_2 and YO_2 .

- Draw the Lewis structures of these two molecules. XO_2 & YO_2
- Determine the bond angle in each of these molecules using the Lewis structures from (a). Justify your answer.

QUESTION (2007:1)

- Complete the table below by:
 - drawing the Lewis structure (electron dot diagram) for each molecule
 - naming the shape of the molecule.

Molecule	(i) Lewis diagram	(ii) Name of shape
CH_3Cl		
NCl_3		
CH_2O		

(b) For each of the molecules in the table, explain why it has the shape you have identified.

- CH_3Cl
- NCl_3
- CH_2O

QUESTION (2006:1)

Complete the table below by:

- drawing a Lewis structure (electron dot diagram) for each molecule
- drawing a diagram to show the shape of the molecule
- naming the shape of the molecule.

Formula of molecule	Lewis structure	Diagram of shape	Name of shape
SF ₂			
CO ₂			
PBr ₃			

QUESTION (2006:4)

Molecules of water (H₂O) and ozone (O₃) each contain 3 atoms and both the molecules are bent. However, the bond angle in H₂O is significantly smaller than the bond angle in O₃. Using Lewis structures, discuss the reasons for the difference in **bond angles** of these two molecules.

QUESTION (2005:1)

The Lewis structure for chlorine, Cl₂, is $\begin{array}{c} \cdot\cdot \\ \text{Cl} \\ \cdot\cdot \end{array} - \begin{array}{c} \cdot\cdot \\ \text{Cl} \\ \cdot\cdot \end{array}$ or $\begin{array}{c} \cdot\cdot \\ \text{Cl} \\ \cdot\cdot \end{array} : \begin{array}{c} \cdot\cdot \\ \text{Cl} \\ \cdot\cdot \end{array}$

Complete the table below by:

- drawing a Lewis structure for each molecule,
- naming the shape of each molecule.

Molecule	Lewis structure	Name of shape
H ₂ S		
PCl ₃		
CH ₃ Br		
COCl ₂ Note C is central atom		

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QUESTION (2004:1)

The Lewis structure for hydrogen chloride, HCl, is $\text{H}:\ddot{\text{Cl}}:$ or $\text{H}-\ddot{\text{Cl}}:$

Complete the table below by:

- (a) drawing a Lewis structure for each molecule,
- (b) naming the shape of each molecule.

Molecule	Lewis structure
CO ₂	
PH ₃	
CH ₂ Cl ₂	
H ₂ CO	
F ₂ O	

Answers

QUESTION (2006:4) means Q4 on the 2006 AS 90308

See NCEA site for assessment schedules