Website: contoureducation.com.au | **Phone:** 1800 888 300
Email: hello@contoureducation.com.au

VCE Chemistry ½
Covalent Molecules [1.6]
Homework

Homework Outline:

Section A: Compulsory Questions (47 Marks)

Sub-Section: Draw Lewis Structures of Atoms & Covalent Molecules

Question 1 (6 marks)

a. Draw the Lewis Structure for each of the following atoms:

i. Sulphur. (1 mark)

ii. Boron. (1 mark)

b. Define what a covalent bond is and why atoms go through covalent bonding. (2 marks)

_____

_____

_____

c. What is the maximum number of covalent bonds an atom of carbon will form? Explain your answer. (2 marks)

_____

_____

_____

Question 2 (8 marks)

Draw the Lewis Structure for each of the following molecules:

a. Water, H_2O. (2 marks)

b. Carbon Dioxide, CO_2. (2 marks)

c. Cl_2. (2 marks)

d. H_2S. (2 marks)

Question 3 (8 marks)

For the following, draw their Lewis Structures.

a. CH_3Br. (2 marks)

b. CF_4. (2 marks)

c. NO_2. (2 marks)

d. CS_2. (2 marks)

Sub-Section: Identify The Geometries (Parent & Molecular) of Molecules, With Reference To VSEPR Theory

Question 4 (4 marks)

For the following, state their molecular geometry.

a. CH_4. (1 mark)

b. H_2O. (1 mark)

c. HCl. (1 mark)

d. O_2. (1 mark)

Question 5 (4 marks)

For the following, state their molecular geometry.

a. CH_2BrCl. (1 mark)

_____

b. HOBr. (1 mark)

_____

c. Draw the Lewis Structure for CO_2, state its parent geometry and molecular geometry. (2 marks)

Question 6 (6 marks)

Classify the parent and molecular geometry of the following molecules.

a. OCSe. (2 marks)

b. NOBr. (2 marks)

c. CH_2O. (2 marks)

Space for Personal Notes

Sub-Section: The 'Final Boss'

Question 7 (11 marks)

Certain molecules are similar to each other in formula but can be very different in real life.

a. For the following molecules, draw their Lewis Structures.

i. SO_2. (2 marks)

ii. SiO_2. (2 marks)

b. Now, compare their molecular geometries with each other. (3 marks)

_____

_____

_____

c. In real life, there are molecules of SO, SO_2 that exist. Explain whether SO_3 exist as a compound, and if so draw its Lewis Structure and state its geometry around the sulphur. (4 marks)

Space for Personal Notes

Section B: Supplementary Questions (50 Marks)

Sub-Section: Draw Lewis Structures of Atoms & Covalent Molecules

Question 8 (4 marks)

State how many covalent bonds the following molecules can form.

a. Silicon. (1 mark)

_____

b. Iodine. (1 mark)

_____

c. Phosphorus. (1 mark)

_____

d. Krypton. (1 mark)

_____

Space for Personal Notes

Question 9 (5 marks)

a. Draw the Lewis Structure for the following.

i. Selenium. (1 mark)

ii. Fluorine. (1 mark)

b. What is the likely formula of the molecule formed between Carbon and Sulphur? Explain. (3 marks)

_____

_____

_____

_____

Question 10 (6 marks)

For the following, draw their Lewis Structures.

a. C_2H_4. (2 marks)

b. Sulphur Dioxide, SO_2. (2 marks)

c. NH_3. (2 marks)

Question 11 (7 marks)

Consider the atom of Nitrogen.

a. Explain how a Nitrogen molecule will be formed using covalent bonds. (3 marks)

b. Draw the Lewis Structure for Nitrogen. (1 mark)

c. Now, draw the Lewis Structure for the molecule that is likely to form between Nitrogen and Oxygen. (3 marks)

Space for Personal Notes

Sub-Section: Identify The Geometries (Parent & Molecular) of Molecules, With Reference To VSEPR Theory

Question 12 (8 marks)

Draw the Lewis Structures of the following and state their molecular geometry.

a. CCl_4. (2 marks)

b. CH_4. (2 marks)

c. H_2S. (2 marks)

d. PCl_3. (2 marks)

Question 13 (4 marks)

a. For the following, state their molecular geometry.

i. BF_3. (1 mark)

_____

ii. H_2Se. (1 mark)

_____

b. Draw the Lewis Structure for CH_2O and state its molecular and parent geometry. (2 marks)

Question 14 (5 marks)

Answer the following questions regarding the VSEPR theory.

a. Briefly explain the VSEPR theory. (2 marks)

_____

_____

_____

b. Explain why a trigonal planar molecular geometry for a molecule with 4 total electron pairs is not possible. (3 marks)

_____

_____

_____

_____

_____

Question 15 (8 marks)

A chemist is designing new molecules for an environmentally friendly refrigerant.

a. One of the proposed compounds is CCl_4. Draw its Lewis Structure and state its molecular geometry. (2 marks)

b. Another molecule CH_3OH is also investigated. State its geometry around the carbon. (2 marks)

_____

c. What is the main similarity between the two compounds? (1 mark)

_____

_____

d. Explain which molecule you would say has a more even distribution of valence electrons. (3 marks)

Space for Personal Notes

CONTOUREDUCATION

Website: contoureducation.com.au | **Phone:** 1800 888 300 | **Email:** hello@contoureducation.com.au

VCE Chemistry ½

Free 1-on-1 Support

Be Sure to Make The Most of These (Free) Services!

- Experienced Contour tutors (45+ raw scores, 99+ ATARs).
- For fully enrolled Contour students with up-to-date fees.
- After school weekdays and all-day weekends.

1-on-1 Video Consults	Text-Based Support
➢ Book via bit.ly/contour-chemistry-consult-2025 (or QR code below). ➢ One active booking at a time (must attend before booking the next).	➢ Message +61 440 137 304 with questions. ➢ Save the contact as "Contour Chemistry".

Booking Link for Consults
bit.ly/contour-chemistry-consult-2025

Number for Text-Based Support
+61 440 137 304