

G11 Chemistry: Class 10 Homework**MULTIPLE CHOICE: Circle the correct answer. [10 marks]**

- Helium atoms do not combine to form He_2 molecules, yet He atoms do attract one another weakly through
 - dipole-dipole forces.
 - ion-dipole forces.
 - dispersion forces.
 - dipole-induced dipole forces.
 - hydrogen bonding.
- Which one of the following substances will have both dispersion forces and dipole-dipole forces?
 - HCl
 - BCl_3
 - Br_2
 - H_2
 - CO_2
- Which one of the following substances should exhibit hydrogen bonding in the liquid state?
 - PH_3
 - H_2
 - H_2S
 - CH_4
 - NH_3
- Which of the following substances should have the highest boiling point?
 - CH_4
 - Cl_2
 - Kr
 - CH_3Cl
 - N_2
- Which of the following substances should have the lowest boiling point?
 - CBr_4
 - CBr_3F
 - CBr_2F_2
 - CBrF_3
 - CF_4

6. For which of the following species are the intermolecular interactions entirely due to dispersion forces?

- A) C_2H_6
- B) CH_3OCH_3
- C) NO_2
- D) H_2S
- E) CaNO_3

7. For which of the following species are the dispersion forces strongest?

- A) C_4H_{10}
- B) C_5H_{12}
- C) C_6H_{14}
- D) C_7H_{16}
- E) C_8H_{18}

8. Choose the response that lists the member of each of the following pairs that has the *higher* boiling point.

(I) H_2O or KI (II) HF or HI (III) Cl_2 or Br_2

- A) H_2O , HF , and Cl_2
- B) KI , HF , and Br_2
- C) KI , HI , and Br_2
- D) H_2O , HI , and Cl_2
- E) KI , HF , and Cl_2

9. Which one of the following substances should exhibit hydrogen bonding in the liquid state?

- A) PH_3
- B) He
- C) H_2S
- D) CH_4
- E) CH_3OH

10. Which of the following atoms does *not* participate in hydrogen bonding?

- A) S
- B) O
- C) F
- D) N

SHORT ANSWER: Answer the following questions.

1. Which intermolecular forces are found in: **[9 marks]**

- a. HF b. CH₄ c. KCl in NH₃ d. Kr

2. Given the following molecular and solutions:

HCl, CO₂, I₂, H₂O, KI (aq), NH₃, NaCl (aq), HF, MgCl₂ in CCl₄, NO, Ar, SO₂

Complete the table below by placing each molecule next to the correct type of intermolecular force. **[12 marks]**

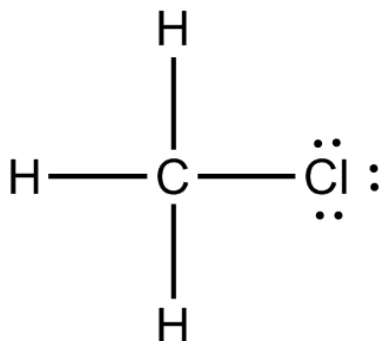
Ion-Dipole	
Ion-Induced Dipole	
Dipole-Dipole (no Hydrogen Bonding)	
Dipole-Dipole (Hydrogen Bonding)	
London Dispersion Forces only	
Dipole-induced-dipole	

3. Benzene, C₆H₆, is a liquid at room temperature. It is sometimes used as a solvent. Which of the following compounds is more soluble in benzene: naphthalene, C₁₀H₈, or sodium fluoride, NaF? Would you expect ethanol, CH₃CH₂OH, to be soluble in benzene? Explain your answers. **[4 marks]**

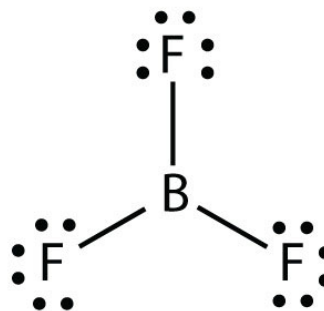
4. The boiling point of pure, liquid hydrogen peroxide H_2O_2 is 150°C . Compare this boiling point to that of water H_2O which has a boiling point of 100°C . Account for this difference. [2 marks]

5. Show all the polarity arrows for the following molecules and determine if the molecular shape is polar or nonpolar. [12 marks]

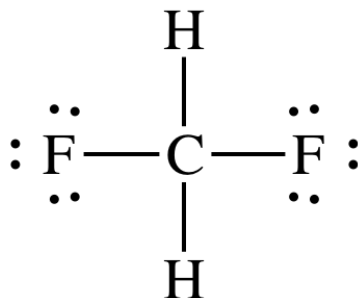
a)



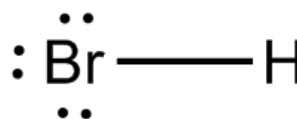
b)



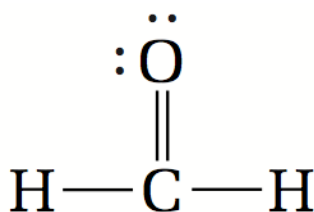
c)



d)



e)



f)

