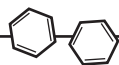


2. Using appropriate principles of chemical bonding and/or inter-molecular forces, explain each of the following.
- The normal vapor pressure of water is lower than the normal vapor pressure of methanol,  $\text{CH}_3\text{OH}$ , when both are measured at  $25^\circ\text{C}$ .
  - The normal melting point of iodine,  $\text{I}_2$  ( $113.5^\circ\text{C}$ ) is higher than the normal melting point of  $\text{Cl}_2$  ( $-100.98^\circ\text{C}$ ).
  - Both solid silver ( $\text{Ag}$ ) and molten  $\text{Ag}$  are excellent conductors of electricity. However, solid silver nitrate,  $\text{AgNO}_3$  is a good conductor only when melted or dissolved in pure water; as a solid, it is a poor conductor.
  - The normal boiling point of water is higher than the normal boiling point of  $\text{H}_2\text{S}$ , even though the molar mass of  $\text{H}_2\text{O}$  is lower, and they both have the same shape.



Liquids maintained at 50 mm Hg pressure

Temp °C	H <sub>2</sub> O	Ethyl alcohol	CCl <sub>4</sub>	Methyl Salicylate	Benzene
0	4.6	12.2	33	.012	27
10	9.2	23.6	56	.012	45
25	23.8	59.0	114	.012	94
50	92.5	222.2	317	.012	271
80	355.1	812.6	843	4.41	753
100	760	1693	1463	12.8	1360

Vapor Pressure Information Chart in (mm Hg) for various liquids is given above

4. The questions below refer to the following experiment: Five flasks, each containing one of the five liquids listed in the table, are hooked to a vacuum pump. The pressure in each flask is **reduced to 50 mm Hg**, and the temperature of each flask is **maintained at 10°C**.
- Under these conditions, which liquids would you observe boiling? Explain.
  - If the temperature is raised to 25°C and the pressure in each flask is maintained at 50 mm, will the same liquids be boiling or different liquids? Explain.