

- Explain, in terms of chemical bonding and intermolecular forces, the following trend in melting points:  $\text{CH}_4 < \text{I}_2 < \text{NaCl} < \text{silica (SiO}_2\text{)}$

**The intermolecular forces in  $\text{I}_2$  and  $\text{CH}_4$  are weak dispersion forces. Iodine is a much larger atom than H or C and hence has more electrons and these are held further from the nucleus. The electron cloud in  $\text{I}_2$  is, therefore, much more polarisable leading to stronger dispersion forces in  $\text{I}_2$ , and a higher melting point.**

**$\text{NaCl}$  has relatively strong ionic bonds between all of the  $\text{Na}^+$  and  $\text{Cl}^-$  ions in the lattice.**

**$\text{SiO}_2$  is a covalent network compound with a very high melting point as strong covalent bonds need to be broken.**