

- Consider the boiling points of the following monosubstituted benzenes.

	C_6H_6	C_6H_5F	C_6H_5Cl	C_6H_5Br	C_6H_5OH	C_6H_5I
b.p.	80 °C	85 °C	132 °C	156 °C	182 °C	188 °C

Explain this order of boiling points.

Phenol (C_6H_5OH) has an anomalously high boiling point compared to the other compounds as it forms strong hydrogen bonds.

The boiling points of the other compounds increase in the expected order, as the halogen increases in atomic number, the size and polarisability of its electron cloud increases and the strength of the intermolecular dispersion forces within the liquid increase.

The strengths of the dipole-dipole forces increase in the opposite order (greatest for C_6H_5F as it contains the most electronegative halogen). This shows that dispersion forces are more important than dipole-dipole forces in this series of compounds.