

**Quiz (Hydrogen Bonding)**

1. Predict whether each of the following pairs of molecules will form hydrogen bond when mixed.
  - (a) HF and NH<sub>3</sub>
  - (b) CH<sub>3</sub>OCH<sub>3</sub> and CH<sub>3</sub>CH<sub>2</sub>OH
  - (c) CH<sub>3</sub>COCH<sub>3</sub> and CHCl<sub>3</sub>
2. Explain briefly why H<sub>2</sub>O has a higher boiling point than both NH<sub>3</sub> and HF.

## Suggested Answer

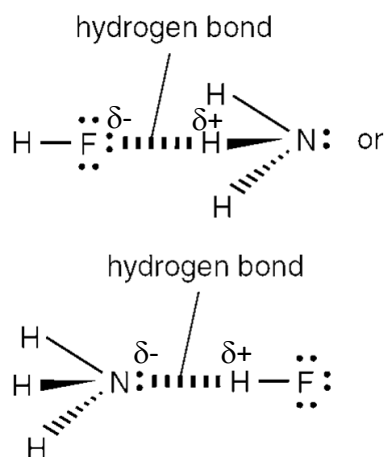
1. (a) Yes

(b) Yes

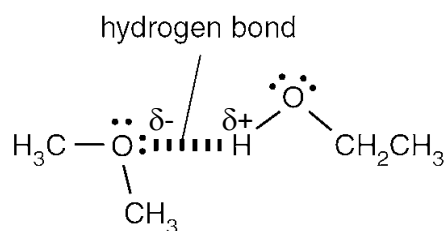
(c) Yes

### Remark:

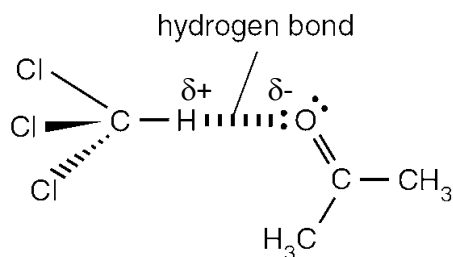
(a) Hydrogen bond between HF and NH<sub>3</sub> molecules:



(b) Hydrogen bond between CH<sub>3</sub>OCH<sub>3</sub> and CH<sub>3</sub>CH<sub>2</sub>OH molecules:



(c) Hydrogen bond between CH<sub>3</sub>COCH<sub>3</sub> and CHCl<sub>3</sub> molecules:



2. Each H<sub>2</sub>O molecule can form two hydrogen bonds on average but each NH<sub>3</sub> and each HF molecule can form only one hydrogen bond on average respectively. Hence, the intermolecular forces between H<sub>2</sub>O molecules are stronger than those between NH<sub>3</sub> or HF molecules.