

Answer on Question #75099, Chemistry / Organic Chemistry

Question:

Maximum amount of hydrogen bonding occurs in case of

- a) H_2O
- b) HF
- c) $\text{C}_2\text{H}_5\text{OH}$
- d) NH_3

According to me answer should be (c) but the answer written is (b) without any solution. Plz help me in this question.

Answer:

The strongest hydrogen bonds forms in the HF because F is the most electronegative element. Thus, H-F bond is the most polarized and H and F atoms have the biggest partial charge.

But if we talk about just quantity of hydrogen bonds, water has more bonds because H_2O has two atoms of hydrogen and two pairs of electrons. And correspondingly each molecule forms four hydrogen bonds with other molecules. (But its hydrogen bonds are weaker than hydrogen bonds in HF).

This is why water has the highest boiling point among given compounds.

So the correct answer must be: **a) H_2O**