Answer on Question#76780 – Chemistry – Organic chemistry

Question:

Rank the four compounds above that contain two carbons from lowest to highest boiling point.

a. ethane C_2H_6

d. methoxymethane C_2H_6O (CH_3OCH_3)

b. ethanol C_2H_6O (CH_3CH_2OH)

f. 1-octanol $C_8H_{18}O$ ($CH_3CH_2CH_2CH_2CH_2CH_2CH_2CH_2OH$)

c. ethanoic acid $C_2H_4O_2$ (CH_3COOH)

Solution:

1. Find four compound that contain two carbons. They are:

    a. ethane C_2H_6

    d. methoxymethane C_2H_6O (CH_3OCH_3)

    b. ethanol C_2H_6O (CH_3CH_2OH)

    c. ethanoic acid $C_2H_4O_2$ (CH_3COOH)

2. Rank the compounds from lowest to highest boiling point. A compound that have the lowest boiling point is ethane C_2H_6, because it has the lowest molar mass and contains only carbon and hydrogen atoms. The next compound is methoxymethane C_2H_6O (CH_3OCH_3), it contains also oxygen and has higher molar mass than ethane, but molecules of methoxymethane do not form hydrogen bonds. The next compound ethanol C_2H_6O has molar mass the same that methoxymethane, but ethanol contains alcohol group –OH that form hydrogen bonds with other molecules. The last compound (compound with highest boiling point) is ethanoic acid. It has the highest molecular mass and has ability to form the most effective hydrogen bonds. It even exist as a dimer: