

## Answer on Question #52193 – Chemistry – Organic Chemistry

### Question:

Which one of the following will have the higher boiling point? (i)  $\text{CH}_3\text{OCH}_3$  or  $\text{CH}_3\text{CH}_2\text{CH}_3$  ii) Arrange the following in the order of their increasing max values: (3) 2-Methyl 1,3 butadiene, 1,3-butadiene, 1,3,5-hexatriene. Give reason in support of your answer.

### Answer (i):

$\text{CH}_3\text{OCH}_3$  has the higher boiling point. Dimethyl ether is a polar molecule which has the higher dipole moment in comparison with the non-polar propane. It leads to the stronger intermolecular interactions for the ether that provides the higher boiling point.

### Answer (ii):

1,3-butadiene < 2-Methyl-1,3-butadiene < 1,3,5-hexatriene

It depends on the two factors that provide the higher boiling point:

- 1) An increase of molecular weight;
- 2) An increase of alkene polarizability. Boiling point is stronger for molecules that contain more unsaturated bonds.