

INTERMOLECULAR FORCES - GENERAL CHEMISTRY FORMATIVE ASSESSMENT - KEY



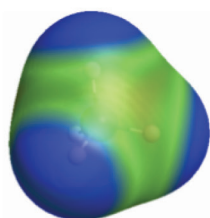
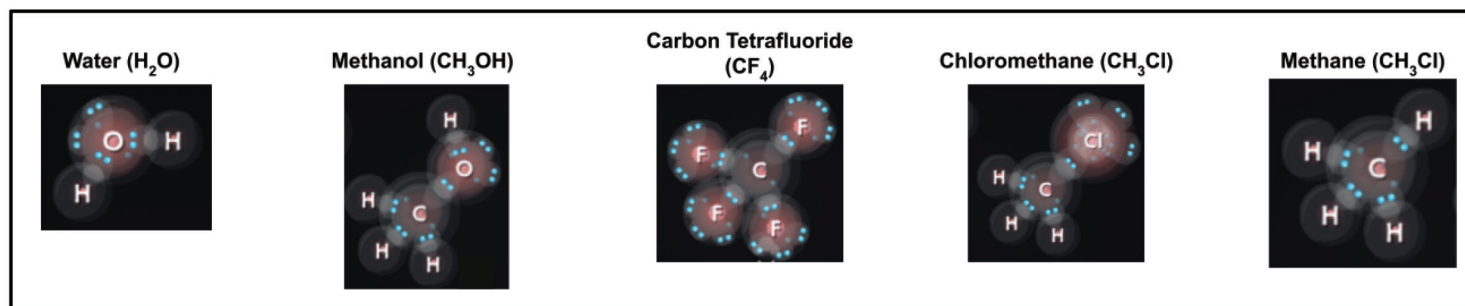
STUDENT CHECK FOR UNDERSTANDING

Concepts:
Molecular Polarity,
Types of IMFs (London
Dispersion Forces,
Dipole-Dipole,
Hydrogen Bonding),
Strength of IMFs,
Molecular
Geometry and Polarity

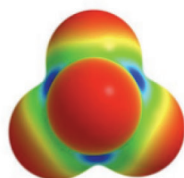
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PART I DIRECTIONS:

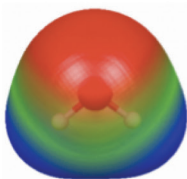
Match each molecule in the box with the correct electrostatic potential map. On the electrostatic potential maps below, brighter colors (red, orange, yellow) indicate areas of the molecule that have a more partially negative charge due to electrons spending more time in those locations. Darker colors (blue and green) indicate areas that have a more partially positive charge due to electrons spending relatively less time around them.



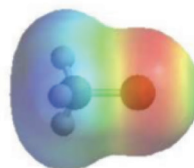
Methane (CH₄)



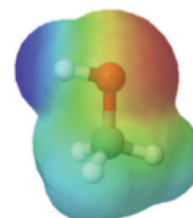
Carbon
Tetrafluoride (CF₄)



Water (H₂O)



Chloromethane
(CH₃Cl)



Methanol (CH₃OH)

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PART II DIRECTIONS:

The arrow in the middle of the image below indicates increasing strength of the intermolecular forces between molecules. Correctly order the molecules shown below by increasing intermolecular forces by filling the larger box with the name of the molecule and the smaller box with the type of intermolecular force that will predominate (LDF, D-D, or HB).

Water (H_2O) Methanol (CH_3OH) Carbon Tetrafluoride (CF_4) Chloromethane (CH_3Cl) Methane (CH_4)

Methane (CH_4) Chloromethane (CH_3Cl) Water (H_2O)

LDF D-D HB

Carbon Tetrafluoride (CF_4) Methanol (CH_3OH)

LDF HB

Increasing Strength of IMFs

Detailed description: A diagram showing five molecules at the top with their ball-and-stick models. Below them are boxes for their names and the type of intermolecular force (IMF) that predominates. A horizontal arrow at the bottom points to the right, labeled 'Increasing Strength of IMFs'. Vertical lines connect the boxes to the arrow, indicating their relative positions on a scale of increasing IMF strength. From left to right, the molecules are: Methane (CH4) with LDF, Carbon Tetrafluoride (CF4) with LDF, Chloromethane (CH3Cl) with D-D, Methanol (CH3OH) with HB, and Water (H2O) with HB.