AP Chemistry: Intermolecular Attractions Problem Set Part 2

## Discuss and compare answers with your classmates. Working asynchronously today? Consider setting up a Zoom session with another AP Chem student!

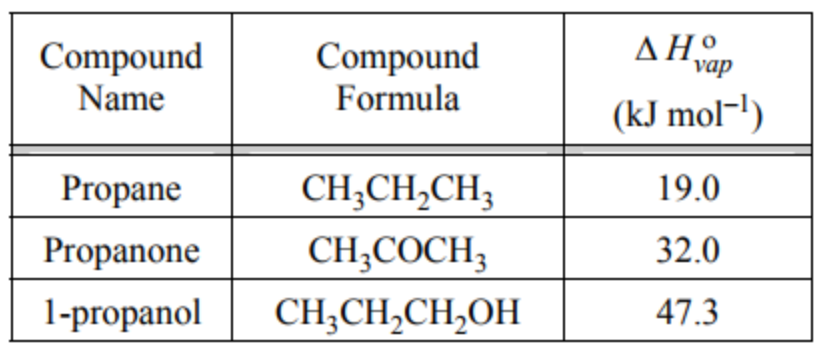
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|  |  |  |
| Propanoic acid |  | Butanoic acid |

1. Shown above are the Lewis structures for propanoic acid and butanoic acid. Propanoic acid has a lower boiling point than butanoic acid.

1. Identify all intermolecular forces present in each molecule.
2. Which intermolecular force is most responsible for the difference in boiling point?
3. Two types of intermolecular forces present in liquid H2S are London (dispersion) forces and dipole-dipole forces.
   1. Compare the strength of the London (dispersion) forces in liquid H2S to the strength of the London (dispersion) forces in liquid H2O. Explain.

b. Compare the strength of the dipole-dipole forces in liquid H2S to the strength of the dipole-dipole forces in liquid H2O. Explain.

3. Use the information in the table below to answer the questions that follow about three organic compounds.



a. Explain why propane has a smaller heat of vaporization than propanone.

b. Explain why propanone has a smaller heat of vaporization than 1-propanol.

4. Which of the figures below correctly shows a hydrogen bond? Explain your reasoning.

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| --- | --- | --- |
|  |  |  |
| Figure A |  | Figure B |
|  |  |  |
| Figure C |  | Figure D |

5. Shown below is a molecule of urea (H2NCONH2), which is highly soluble in water. Draw and label the hydrogen bonds between urea and water.

