Name:

The standard enthalpy and entropy of condensation are given in the table below for three substances (1,2, and 3).

1. Calculate the Free Energy (DG) of condensation at 250 K and 370 K for each substance.
2. Fill in the state (liquid or vapor) for each substance at 250 K and 370 K. The sign of the free energy of condensation tells you about the state.
3. Rank the strength of the molecular interactions of the three substances in the liquid phase. Molecular interactions are related to the magnitude of the enthalpy of condensation.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| substance | DH (kcal/mol) | DS (cal /mol K) | DG (250 K) | state  (250 K) | DG (370 K) | state  (370 deg) |
| 1 | -163 | -436 |  |  |  |  |
| 2 | -116 | -366 |  |  |  |  |
| 3 | -141 | -418 |  |  |  |  |

Please notice the units: kcal/mol for enthalpy vs cal/mol K for entropy (divide TDS by 1000).