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| **Vapor Pressure of Liquids** | Name: |  |
| Hand-In, Chem 210L | Partner: |  |

See the attached rubric for more detailed information about grading.

1. (4 points) On the basis of your data (attach graph below), what is the relationship between vapor pressure and temperature for a given liquid? Explain the physical basis for this relationship. {Be sure to explain the relationship, not just identify it.}

{Attach vapor pressure vs. temperature graph here.}

{Type answer here.}

2. (3 points) What are all the intermolecular forces expected for each of the liquids you studied? (Knowing the structures of the substances will help you answer this question.)

{Type answer here.}

3. a. (3 points) Choose the substance with the highest vapor pressure at a given temperature. With reference to your answer in question 2 above, explain why this substance has the highest vapor pressure.

{Type answer here.}

b. (6 points) In a similar manner, explain the order of vapor pressures for **all three** of the other substances studied. That is, ***on the basis of the intermolecular forces***, why does the substance with the next lowest vapor pressure have the next lowest vapor pressure, etc.?

{Type answer here.}

4. (4 points) Consider the formula, molar mass, and structure of water. On the basis of these properties of water where would you expect its vapor pressure to be relative to the four liquids you studied in this experiment? Explain.

{Type answer here.}

See the attached rubric on the next page for more detailed information about grading.

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|  | **Unsatisfactory** | **Borderline** | **Satisfactory** | **Excellent** | **Score** |
| **Q #1**  **Graph and v.p vs. T** | No graph  **0 points** | Significant errors in graph or explanation is very weak or missing.  **2-3 points** | Errors in graph formatting or explanation is a little weak.  **3 points** | Graph is correct and explanation of trend is correct.  **4 points** | 4 pts. |
| **Q #2**  **IMF’s.** | None of the intermolecular forces are properly identified.  **0 points** | **1 point** | **2 points** | Intermolecular forces for each liquid are properly identified.  **3 points** | 3 pts. |
| **Q #3a**  **Why highest v.p.?** | Reason for highest vapor pressure incorrect/poorly explained.  **0 points** | **1 point** | Reason for highest vapor pressure correct but not very clearly explained.  **2 points** | Reason for highest vapor pressure clearly and correctly related to intermolecular forces.  **3 points** | 3 pts. |
| **Q #3b**  **Order of v.p.s** | Order of vapor pressures reported but not explained based on IMFs.  **0-1 points** | **2-3 points** | -2 points for each incorrectly explained order.  **4-5 points** | Order of vapor pressures is correctly explained based on intermolecular forces.  **6 points** | 6 pts. |
| **Q #4**  **Water v.p. rel. to other 4 liquids** | No prediction or no explanation of predicted v.p. of water.  **0 points** | Prediction incorrect but some explanation is present.  **1-2 points** | Prediction correct but reason not explained well.  **3 points** | Well-reasoned prediction and explanation for v.p. of water.  **4 points** | 4 pts. |
| **Total** |  |  |  |  | 20 pts |