**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Colligative Properties**

Background Information: A colligative property is an extensive property in which the actual solute identity is irrelevant, but the amount of solute added will change the property.

Guiding Question: How will the addition of different solutes affect the freezing and boiling points of pure water?

Pre-Lab Questions:

1. Explain why it is important to stir the solutions while finding their temperature.
2. Explain why it is important to clamp the thermometer so it doesn’t touch the bottom of the beaker while it is heating or cooling.
3. What is the normal melting point and the normal boiling point of pure water?
4. Identify a solute to add to water as an independent variable. Identify which point (freezing or boiling point) to test as the dependent variable.
5. **Prediction:** Explain how your independent and dependent variable may be correlated.

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**Reasoning:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Procedure: Describe the steps you will take to identify if boiling or freezing points will change when your solute is added to pure water. Be sure to include how you will measure the amounts of solute and solvent, as well as what equipment you will need.

**Team Data**



|  |  |
| --- | --- |
| Mass Solute Added | Phase Change Temperature |
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|  |  |
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|  |  |
|  |  |
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**Class Data**

|  |  |
| --- | --- |
| **Trial description** | **Results** |
| Mass of NaCl versus Boiling Point |  |
| Mass of NaCl versus Freezing Point |  |
| Mass of CaCl2 versus Boiling Point |  |
| Mass of CaCl2 versus Freezing Point |  |
| Mass of C6H12O6 versus Boiling Point |  |
| Mass of C6H12O6 versus Freezing Point |  |
| Mass of Sand versus Boiling Point |  |

Questions:

1. Construct a **claim** that supports or contradicts the prediction made in the pre-lab questions.
2. Provide **evidence** that supports your claim. Use your **reasoning** skills to explain why your evidence is relevant.
3. **Justify** the steps you took to obtain the evidence you obtained.
4. **Explain** the relationships between the types of compounds added to water and their affect on the boiling point and freezing point of pure water.