

PS 100

Experiment 7, Chapter 12

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Title: Potential energy and phase transitions

**Objectives:** Students will observe and describe the energy changes associated with a change from liquid to solid.

**Instructions:** Each room contains a couple of reusable hand warmers. Each of the hand warmers is filled with a solution (sodium acetate) that normally solidifies at approximately 50C (120° F). This material has a tendency to super cool (remain liquid below its melting point) until it is provided with a trigger to start the crystallization process. In these hand warmers, flicking a small metal disk will cause the sodium acetate to begin to solidify.

1. If: What do you think has more energy, solids or liquids? What do you know about total energy? What laws apply here?

And: You flex the disk turning the liquid into a solid and measure the temperature before and after the change of state.

2. Then: What do you predict will happen to the temperature?

3. And/but: What did happen to the temperature?

4. Therefore: What can you conclude about the energy of the atoms?

5. These are called reusable hand warmers. What would you have to do in order to be able to reuse them?

I personally participated in the activity and wrote the response in my own words:

Signature: \_\_\_\_\_