

Exploring an Exothermic Reaction with Sodium Acetate

Materials:

- Small sauce pan (or large beaker with a heating element)
- Clean glass jar or second large beaker
- 1 liter of vinegar (acetic acid)
- 4 tablespoons of baking soda (sodium bicarbonate)
- *roasting pan and ice

Procedure:

1. Pour vinegar into a medium saucepan.
2. Slowly add baking soda, making sure that the reaction doesn't overflow the container. Stir gently. Note that mixing baking soda and vinegar will yield sodium acetate, water and carbon dioxide gas.
3. Once the mixture has stopped reacting, you should take and record the temperature.
4. To get sodium acetate by itself, you need to get rid of the water. You can do this by boiling the mixture down - causing the water to evaporate.
5. Heat the mixture on medium-low heat. While you are doing this, you'll want to watch for the crystals that form on the sides of the pan, as well as ones that form on the top of the liquid.
6. As crystals form on the side, carefully scrape off a few and set aside. You'll need these for later to initiate the 'freezing' reaction.
7. After you've reserved some crystals for later, use a metal spoon to gently push back any other crystals into the mixture.
8. Watch for the crust to form on the top of the liquid. (Note - this may take an hour or more.) Once you see the crust, remove the mixture immediately and pour into a microwave-safe container. (The container needs to be able to withstand hot and cold temperatures.)
 1. 7. Put the covered container in the refrigerator or in an ice water bath.
9. Once the mixture has cooled, take some of your reserved crystals, and reintroduce them to the mixture. What happens? Take the temperature again as well.