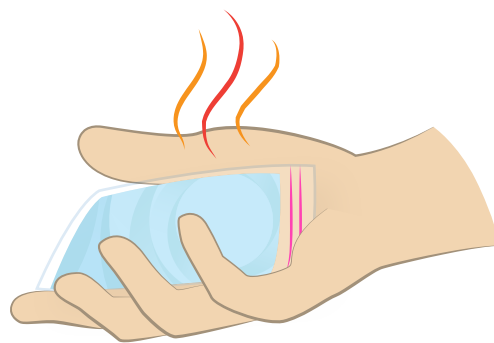


Homemade Hand Warmer

Learn about exothermic reactions by creating a hand warmer to keep your hands toasty!

Collect

- A clean diaper
- Scissors
- 1 zip-top sandwich bag
- Calcium chloride pellets (typically sold as ice melt)
- Water
- Commercial hand warmer (like Hot Hands) - optional
- 2 Thermometers - optional



Prepare the materials.

1. Cut open the base of the diaper and gently shake it over a plate. You should start to see tiny crystals fall out - these crystals are an absorbant polymer that allows the diaper to hold liquid!
2. Keep shaking until all of the crystals are out. Pick out any fibers that may have fallen out of the diaper before adding all of the collected crystals to the zip-top bag.

Heat it up.

3. Slowly add water to the bag until the crystals absorb enough to form a gel. This could be anywhere between 1/2 to 1 cup of water depending on the size of the diaper.
4. Add two tablespoons of calcium chloride pellets to the bag.
5. Seal the bag, making sure you squeeze as much air out as possible, and then mix the pellets into the gel with your hands. Can you feel it getting warm?

What's happening?

Your homemade hand warmer is the product of an exothermic reaction; a reaction that released energy in the form of heat. Calcium chloride is the active ingredient in many types of ice melt, because they produce heat when they dissolve in water. The crystals from the diaper hold the water in a gel so that you aren't carrying around a bag of liquid.

Take it further!

Put your homemade hand warmer to the test! Open up a commercial hand warmer and give it a shake to start the reaction. Place one thermometer next to the commercial hand warmer and one next to your homemade warmer. Record the initial temperature reading of each hand warmer. Check back every 15 minutes, making sure to record the temperature of each warmer each time. How long did the hand warmers last? Which hand warmer got the hottest? Which hand warmer stayed warm the longest?