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Designing A Hand Warmer Lab  
Answers

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## Answers

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### **Chemistry Designing A Hand Warmer**

of some chemical reactions. One example is the hand warmer. There are several types of hand warmers commercially available that take

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advantage of different chemical reactions to provide a gentle heat for an extended period of time. One type of hand warmer contains a mixture of dry chemicals, including among other things powdered iron and salt.

## **AP Chemistry: Designing an Effective Hand Warmer**

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Many commercial hand warmers consist of a plastic package containing a solid and an inner pouch filled with water. When the pack is activated, the solid dissolves in water and produces a large...

## **Lab #12 - Designing A Hand Warmer - LHS AP Chemistry**

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## Answers

Lab #12: Designing an Effective Hand Warmer - AP Chemistry - Chemistry  
Students study the various energy changes that occur with the formations of solutions for laboratory salts. From this data they will create the best and safest hand warmer. Students will determine the heat of solutions for each solid and analyze the cost



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## **Lab #12: Designing an Effective Hand Warmer - AP Chemistry ...**

PURPOSE: to determine which of the 3 ionic compounds (NaCl, LiCl, or NaCH<sub>3</sub>COO) is most suitable for use as a hand warmer  
PROCEDURE: DAY 1 (Part 2 only): 1) Measure out 2 separate samples of 100.0 mL of distilled water 2)

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Heat one to about  $50^{\circ}\text{C}$ , and place other one in calorimeter (at around  $20^{\circ}\text{C}$ ) 3) Add heater water to calorimeter, cover top, wait 15 seconds, measure temp 4) Repeat DAY 2: 1) measure 40mL of distilled water into a styrofoam cup on stir plate 2) record temp of water 3) ...

## **Designing a Handwarmer Lab**

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### **Report (AP Chemistry) Essay ...**

When the packet is squeezed, the water and the soluble substance are mixed, the solid dissolves, and the packet becomes warm. In this experiment, you will learn how a hand warmer works and use chemistry to design an effective, safe, environmentally benign, and inexpensive hand warmer. EXPLANATION

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TO STRENGTHEN STUDENT  
UNDERSTANDING:

## **Guided Inquiry: Designing the Ideal Hand Warmer**

Hannah Boster, Seth Lewis, and William Makinen's recorded powerpoint presentation summarizing our work on the Flinn Handwarmer Lab. Created for

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Mr. Kerns' AP...

## **Ap Chemistry Hand Warmer Lab**

Chemical hand warmers rely on exothermic chemical reactions to release heat. There are two main types of chemical hand warmers. One type releases heat by air activation. The other type releases heat when a

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## Answers

supersaturated solution crystallizes. Air-activated hand warmers are single use products. Chemical solution hand warmers are re-usable.

### **How Chemical Hand Warmers Work - ThoughtCo**

Data 1. Gather materials 2. Set up a calorimeter consisting of two nested

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polystyrene cups in a ring clamp attached to a support stand. 3. Measure 45 mL of distilled water in a graduated cylinder 4. Pour water into calorimeter 5. Take temperature of the water and record as initial temperature 6. ...

**Designing a Hand Warmer by  
Xochitl Benitez on Prezi Next**

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Based on the results of the lab, hand warmers will benefit most with the use of LiCl since it raised the temperature of the solutions to about 19 degrees Celsius. The only issue with LiCl is that it is very expensive compared to the other materials (\$32.75 per 500 grams).

## **The Hand Warmer Design Challenge**



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Answers  
**by Jason Santana on Prezi ...**

Chemistry Designing A Hand Warmer of some chemical reactions. One example is the hand warmer. There are several types of hand warmers commercially available that take advantage of different chemical reactions to provide a gentle heat for an extended period of time.

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## **Chemistry Designing A Hand Warmer Lab Answers**

In the Designing a Hand Warmer Inquiry Lab Solution for AP<sup>®</sup> Chemistry, students investigate energy changes and calorimetry with formations of solutions. Students challenge themselves to design the best, all-

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around hand warmer.

## **FlinnPREP™ Inquiry Labs for AP® Chemistry: Designing a ...**

AP Chemistry Designing a Hand Warmer  
Lab by Rebecca Poliner 2 years ago 10  
minutes, 49 seconds 2,413 views

Designing a Hand Warmer Lab Designing  
a Hand Warmer Lab by Alex Brinley 3

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years ago 10 minutes, 4 seconds 5,525 views This is a video outlining a Flinn Lab on , designing a hand warmer , . It was created by Alex Brinley, Charis Conwell ...

## **Designing A Hand Warmer Ap Lab Answers**

Design and make a rechargeable

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handwarmer which, when it is needed, can be set off to provide a steady supply of heat at a comfortable temperature. ... Search of More Solutions provides material for chemical “egg race” competitions that help to put the fun back into chemistry, and gives students that “little bit extra” to motivate them ...

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## **Design a pocket handwarmer | Resource | RSC Education**

Carter 1 Cameron S. Carter 4 th Period -  
AP Chemistry November 20, 2016

Designing a Hand Warmer Claim: Our  
hand warmer will be using the chemical  
compound Calcium chloride ( $\text{CaCl}_2$ ). As,  
of the three compounds tested, Calcium  
chloride produced the most significant

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heat variance from its initial temperature to its final temperature.

## **Designing a Hand Warmer - Carter 1 Cameron S Carter 4th ...**

Designing a Hand Warmer Lab

Introduction: This lab will require you to put your chemistry skills to commercial use! From instant cold packs to

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flameless ration heaters and hand warmers, the energy changes accompanying physical and chemical transformations have many consumer applications.

## **Designing a Hand Warmer Lab - science with ms. hall**

The Heat Solution Instant Handwarmer



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Thermodynamics Chemistry  
Demonstration is fun and reusable. If  
pressure is applied to an activator, a  
crystal forms in a supersaturated  
solution of sodium acetate. This causes  
a solution to crystallize. See more  
product details

## **The Heat Solution Instant**

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## **Handwarmer**

Hand warmers usually come in a package containing a liquid and solid unmixed, once you release the solid into the liquid the chemical reaction begins and heat ends up being a product. This is done by creating a reaction that releases energy when it occurs. The amount of thermal energy is directly

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proportional to temperature.

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