

Name

Period

ACTIVITY # 10

ENERGY MOVEMENT

Part I: Hot Pack Demo

Before	After

Is this a physical or chemical change?

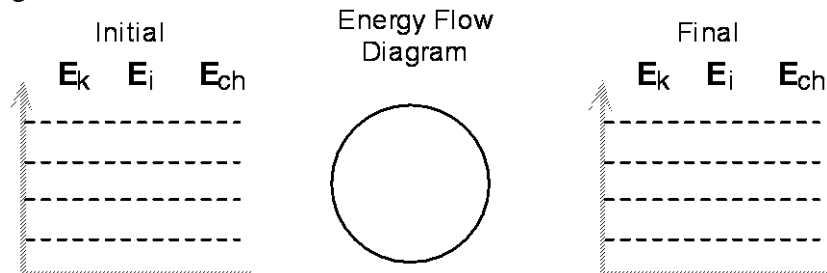
Draw a diagram of hot pack

Draw arrows showing which direction heat is being transferred

Label the system and surroundings

Compare the molecular motion in the hot pack prior to and after the reaction (hint: think about kinetic energy)

Fill in the energy diagrams



Explain change in each energy account: How do you know if the account stays the same or changes?

E_k :

E_i :

E_{ch} :

PRACTICE SHEET #46

ENERGY MOVEMENT

Consider the following scenario:

Often in the morning you may have noticed that your lawn is covered in dew. Dew is water vapor (gaseous water) that has condensed in the night on grass.

1. Is this a physical or chemical change? How do you know?

2.

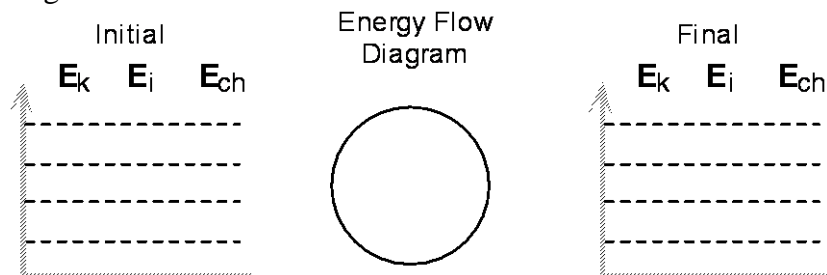
a. Draw a diagram of a water droplet on a blade of grass.

b. Label the system and surroundings – use the water droplet as your system.

c. Draw an arrow showing the direction of heat transfer.

3. Compare the molecular motion in the water droplet before and after it condenses on the blade of grass.

4. Fill in the energy diagram for this reaction.



Explain the change in each energy account: How do you know if the account stays the same or changes?

E_k :

E_i :

E_{ch} :

Consider the following scenario.

Casey decides to build a volcano for the school science fair. The instructions say to combine vinegar and baking soda. The products of this reaction include lots of foam and the Tupperware container gets very cold.

1. Is this a physical or chemical change? How do you know?

2.

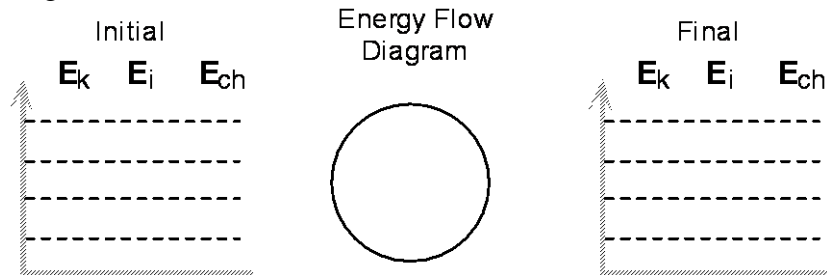
a. Draw a diagram using the volcano as your system.

b. Label the system and surroundings.

c. Draw an arrow showing the direction of heat transfer.

3. Compare the molecular motion in the system before and after the reaction.

4. Fill in the energy diagram for this reaction.



Explain the change in each energy account: How do you know if the account stays the same or changes?

E_k :

E_i :

E_{ch} :

ACTIVITY # 10 CONT.

ENERGY MOVEMENT

For each station make sure to make observations and answer each of the questions in **COMPLETE SENTENCES**. Record any changes in temperature using the thermometer but also record other types of changes (color, smell, phase). You do not need to go in a specified order, just be sure to complete all stations.

Station #1

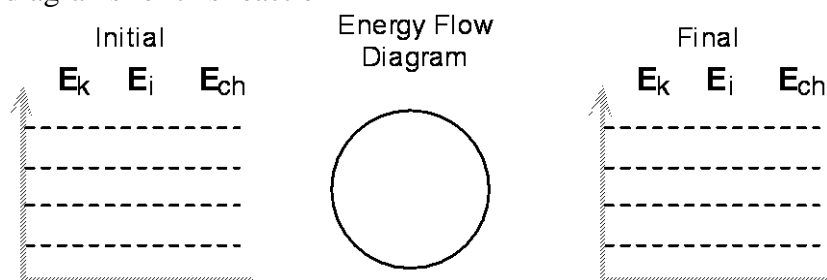
Instructions: Mix 10 mL of HCl and 10 mL of NaOH in a 50 mL beaker. Waste may go down the sink.

Draw a diagram of the system a. Draw arrows showing which direction heat is being transferred b. Label the system and surroundings	Observations

1. Is this a physical or chemical change? How do you know?

2. Compare the molecular motion in the system before and after the reaction.

3. Fill in the energy diagrams for this reaction



Explain change in each energy account: How do you know if the account stays the same or changes?

E_k :

E_i :

E_{ch} :

CONTROVERSIAL – don't recommend b/c too complicated to have dissolving be exo and endothermic
Station #6

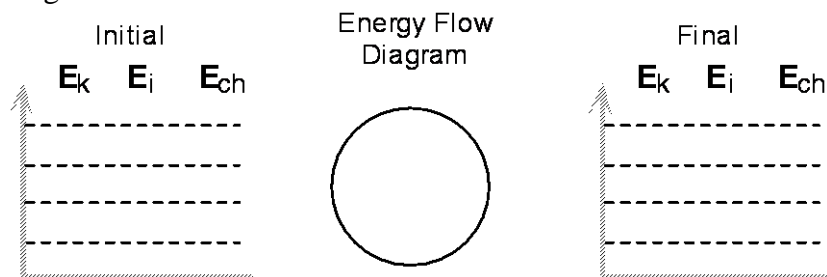
Instructions: Add one spatula full of CaCl_2 to 15 mL of water. Waste may go down the sink.

<p>Draw a diagram of the system</p> <ol style="list-style-type: none">Draw arrows showing which direction heat is being transferredLabel the system and surroundings	<p>Observations</p>
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1. Is this a physical or chemical change? How do you know?

2. Compare the molecular motion in the system before and after the reaction.

3. Fill in the energy diagrams for this reaction



Explain change in each energy account: How do you know if the account stays the same or changes?

E_k :

E_i :

E_{ch} :

Analysis and Conclusion

Use the space below to group the 6 reactions you observed into categories based on HEAT TRANSFER; don't worry about the type of reaction or the phases involved.

Create a name for each group of reactions.

Obtain a 3 x 5 card from the instructor and write down your names and the reaction in the lab today the most closely resembled the hot pack reaction. Only consider heat transfer, don't worry about phases.

- Create the energy diagram for the cold pack reaction. Explain how the energy moved during the course of the reaction. Be sure to make reference to each type of energy (kinetic, interaction and chemical).

