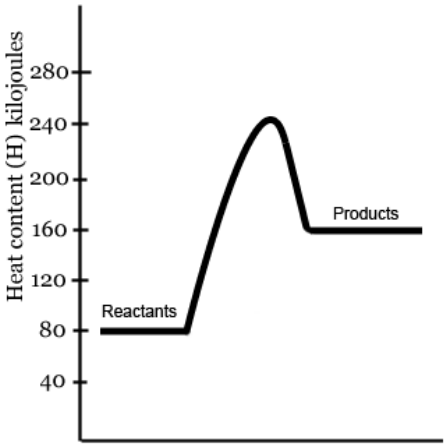
Name: _____ Period: _____

Specific Heat Guided Notes

Energy

- _____is the ability to do work or produce heat
- Two types of energy are _____ and _____.
- _____ is a measure of average kinetic energy
- Energy can be measured in _____, _____, or _____ (we use Joules)
- _____: energy can be converted from one form to another but can be neither created nor destroyed
- _____ is used to represent heat energy
- According to the law of conservation of energy: $Q_{lost} = Q_{gained}$
- When one object or reaction loses energy, that same amount of energy is gained by something else
- A reaction in which heat is lost/released is considered _____.
- A reaction in which heat is gained/absorbed is considered _____.

- Energy diagram:
  - How much energy did this reaction start with?
  - How much energy did this reaction finish with?
  - Did this reaction gain or lose energy? How much?
  - Is this an endothermic or exothermic reaction?



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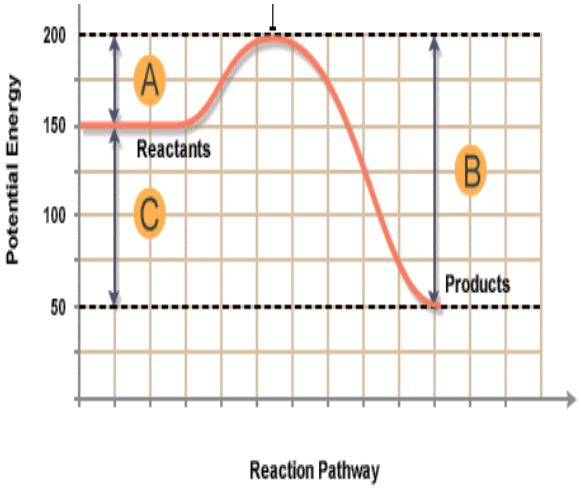

Name: _____ Period: _____

Specific Heat Capacity

- Specific Heat Capacity- The amount of energy required to raise the temperature of _____ gram of a substance by _____ Celsius degree.
- Practice:
  - How much energy would it require to raise 1g of solid water by 1 C?
  - How much energy would it require to raise 1g of iron 1 ◦C?
  - Which substance requires the most energy to raise 1g of substance by ◦C?

Thermochemistry

- for pure substance in single phase of matter we can calculate how much Energy needed/used using the following equation: $Q = mC\Delta T$

Q = _____ in units of _____

m = _____ in units of _____

C = _____ in units of _____

ΔT = _____ in units of _____

$$\Delta T = T_f - T_i$$

- When energy is released, Q _____ 0
- When energy is absorbed, Q _____ 0
- Practice:
  1. Determine the amount of energy (heat) in joules required to raise the temperature of 7.40g water from 29.0 ◦C to 46.0 ◦C? (the specific heat of water is 4.184 J/g ◦C)

  2. Calculate the energy required to heat 454g of water from 98.6 ◦C to 5.40 ◦C, the specific heat of water is 4.184 J/g◦C.

  3. A 1.6g sample of an unknown metal requires 5.8J of energy to change its temperature from 23 ◦C to 41 ◦C. What is the specific heat of the unknown metal?