Specific Heat
Chemistry

Name _____

$$Q = m\,C\,\Delta T$$

1. _____ is the amount of energy that it takes to raise the temperature of 1 gram of a substance by 1 K

2. _____ is the temperature at which all molecular motion ceases

3. _____ process is a change in matter in which energy is absorbed

4. _____ process is a change in matter in which energy is released

5. What is the specific heat of a substance that absorbs 2500 joules of heat when a sample of 100 g of the substance increases in temperature from 10 °C to 70°C?

6. If 200 grams of water is to be heated from 24.0°C to 100.0°C to make a cup of tea, how much heat must be added? The specific heat of water is 4.18 J/g·C

7. How many grams of water would require 2200 joules of heat to raise its temperature from 34°C to 100°C? The specific heat of water is 4.18 J/g·C

8. A block of aluminum weighing 140 g is cooled from 98.4°C to 62.2°C with the release of 1080 joules of heat. From this data, calculate the specific heat of aluminum. *Check your answer with a specific heat table.*

9. 100.0 mL of 4.0°C water is heated until its temperature is 37°C. If the specific heat of water is 4.18 J/g°C, calculate the amount of heat energy needed to cause this rise in temperature.

10. A total of 54.0 joules of heat are absorbed as 58.3 g of lead is heated from 12.0°C to 42.0°C. From these data, what is the specific heat of lead?

11. The specific heat of wood is 2.03 J/g·°C. How much heat is needed to convert 550 g of wood at -15.0°C to 10.0°C?

12. What is the total amount of heat needed to change 2.25 kg of silver at 0.0°C to 200.0°C? The specific heat of silver is 0.129 J/g·°C

13. Granite has a specific heat of 800 J/g·°C. What mass of granite is needed to store 150,000 J of heat if the temperature of the granite is to be increased by 15.5°C?

14. A 55 kg block of metal has an original temperature of 15.0°C and 0.45 J/g·°C. What will be the final temperature of this metal if 450 J of heat energy are added?

15. Object A specific heat is 2.45 J/g·°C and object B specific heat is 0.82 J/g·°C. Which object will heat up faster if they have the same mass and equal amount of heat is applied? Explain why.

Convert the following to Celsius.

1) 32° K _____

2) 45° K _____

3) 70° K _____

4) 1020 K _____

5) 200° F _____

6) 273 K _____

7) 350° F _____

8) 0° K _____

9) 100 ° F _____

Convert the following to Kelvin.

10) 0° F _____

11) -50° C _____

12) 90° C _____

13) 70° F _____

14) -150° C _____

15) 400° F _____