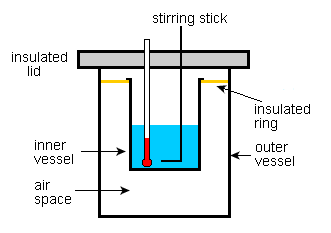
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**Calorimetry, ENERGY and Artisan Soap QUIZ!**

Matching:

1. \_\_\_\_\_\_\_ Joule a. a system releases energy to the surroundings

2. \_\_\_\_\_\_\_ calorie b. form of energy that transfers from moving particles

3. \_\_\_\_\_\_\_ enthalpy c. change in heat of a system

4. \_\_\_\_\_\_\_ heat d. a system absorbs energy from the surroundings

5. \_\_\_\_\_\_\_ exothermic e. SI unit for energy

6. \_\_\_\_\_\_\_ endothermic f. amount of energy required to raise the temp of 1 g of water1 ° C.

Fill-in: Endothermic decomposed release chemical change

Absorbed required exothermic physical change

****7. A chemical reaction that involves the breaking of bonds is considered an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 8. reaction because energy is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. For example if a water molecule is

9-10. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ into hydrogen and oxygen, energy is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ . If oxygen and hydrogen are bonded together to form water, this bond formation would

11-12. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ energy and is considered \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Both reactions create new

13. Substances as products and represent a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

True / False:

14. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ The kilocalorie (C) is the unit used to calculate energy in food.

15. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Liquids with high vapor pressures have weak intermolecular interactions and low b.p.

16. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Heat of fusion is the amount of heat required for dissolving 1 mole of solute.

17. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Temperature is a measure of the average kinetic energy of the particles.

18. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Heat of fusion and heat of solidification have the same value but opposite signs.

19. Which has a higher specific heat, water or iron?

20. Extended Response (Explain):

Calculations: q = C \* m \* T specific heat capacity of water = 4.184 J/g C **or** 1 cal/g C

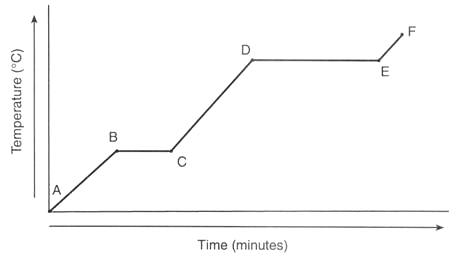
q = heat C = specific heat capacity T = change in temperature

21. How many joules are needed to warm 25 grams of water from 25° C to 50° C? (show work for credit)

22-23. One Cheetoh was burned under a canister of 100 ml of water and the temperature of the water went from 22.0 to 26.12 °C. How much heat in **calories** did the Cheetoh contain?

(show work for credit)

Use graph to answer#24-25.



24. Where does melting occur?

1. D to C b. A to B c. B to C d. not on this graph

25. Where does solidification occur?

a. D to E b. C to B c. A to B d. E to D

26-30. Fill in the blanks and answer the written question in complete sentences. **The answers appear in red print below for people reading this to learn about the success of these laboratory experiments.**

Melting coconut oil and palm oil to make artisan soap involves a **phase or physical** change which is **endothermic because it absorbs heat**. Dissolving lye or sodium hydroxide in ice and water involves a **phase or physical** change and is **exothermic because it releases heat**. When the lye solution and melted fats are mixed together a **chemical** change occurs called saponification. This process makes soap which can be unmolded and sliced into bars of soap 24-72 hours later but the soap needs to cure for 3-6 more weeks. Why? Explain using complete sentences***. The soap needs to dry and harden so it does not dissolve into a gloppy mess when used in at the sink or in the shower or tub. But more importantly, the soap needs to cure – or finish reacting so that no lye is left unreacted in the bar. We superfatted the soap but it still needs 3-6 weeks to make sure all the lye has a chance to completely react.***