SHORT ANSWERS:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_1. Food, fuel, and chemicals are examples of this type of energy

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_2. ∆H = +. What happens to heat (absorbed or released)?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_3. Unit of heat or energy

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_4. Used to measure heat flow (chemical or physical change)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_5. The heat flow of a system at constant pressure

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_6. Heat capacity that depends on mass & chemical composition

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_7. 40.7 kj/mol or 539.4 cal/g

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_8. 80 cal/g C or 6.01 kj/mol

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_9. Average kinetic energy of molecules & unit?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_10. ∆H = -. What happens to heat (absorbed or released)?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_11. 25° C

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_12. Transfers between objects from warmer to cooler

13. Two solids, barium hydroxide octahydrate and ammonium thiocyanate are mixed in a beaker, and a liquefied mixture is produced (chemical reaction) that causes the beaker to freeze to a piece of wood. Watch: <http://somup.com/cYeXldhBRL> . Is the reaction endothermic or exothermic? (Explain).

14. How can evaporation from our bodies be endothermic when it cools us down? (Doesn’t heat have to be released to cool us down?)

15. Write the conversion equation for “F” to “C” and “C” to “F”

##  F = C =

16. Write the conversion equation for “K” to “C” and “C” to “K”

##  K = C =

17. Complete the following chart using the conversion equations

|  |  |  |  |
| --- | --- | --- | --- |
|  | Fahrenheit | Celsius | Kelvin |
| Boiling point (water) |  |  |  |
| Room Temperature |  |  |  |
| Melting point (water) |  |  |  |
|  |  |  | 173 |
| Absolute Zero |  |  |  |

ANSWERS

**Potential Energy** 1. Food, fuel, and chemicals are examples of this type of energy

**Endothermic (absorbed)** 2. ∆ H = +. What happens to heat (absorbed or released)?

**Calorie or Joule** 3. Unit of heat or energy

**Calorimeter** 4. Used to measure heat flow (chemical or physical change)

**Enthalpy** 5. The heat flow of a system at constant pressure

**Specific Heat (Cp)** 6. Heat capacity that depends on mass & chemical composition

**∆Hvaporization of water** 7. 40.7 kj/mol or 539.4 cal/g

**∆Hfusion of water** 8. 6.01 kj/mol or 79.72 cal/g

**Temperature, K** 9. Average kinetic energy of molecules & unit?

**Exothermic (released)** 10. ∆ H = - . What happens to heat (absorbed or released)?

**Room Temperature** 11. 25° C

**Heat** 12. Transfers between objects from warmer to cooler

13. Two solids, barium hydroxide octahydrate and ammonium thiocyanate are mixed in a beaker, and a liquefied mixture is produced (chemical reaction), causing the beaker to freeze to a piece of wood. Watch: <http://somup.com/cYeXldhBRL> . Is the reaction endothermic or exothermic? (Explain).

***(1) For solids to become liquid (melting) requires energy to be absorbed (endothermic reaction) by the chemicals. At a quick glance, one would think that since the beaker becomes cold, heat must be released into the surroundings. However, since the temperature decreased significantly, (2) the amount of energy NEEDED to break the molecular bonds of the reactants must be MORE than the energy released when the new bonds form. Therefore, the reaction absorbed much more energy from the surroundings than was released when the new products formed:***

Ba(OH)2.8H2O (s) + 2 NH4SCN (s) --> Ba(SCN)2 (s) + 10 H2O (l) + 2 NH3 (g)

14. How can evaporation from our bodies be endothermic when it cools us down? (Isn’t heat released to cool us down?)

***Evaporation is a similar paradox to the previous question in that heat is absorbed by “sweat”, yet we cool off in the process. Sweat drops absorb the heat from our bodies (endothermic), and the evaporation causes this heat to be taken away from the surface of our bodies, thus, cooling us down.***

15. Write the conversion equation for “F” to “C” and “C” to “F”

##  F = **9/5 C + 32**  C = **5/9 (F - 32)**

16. Write the conversion equation for “K” to “C” and “C” to “K”

##  K = **C + 273** C = **K - 273**

17. Complete the following chart using the conversion equations

|  |  |  |  |
| --- | --- | --- | --- |
|  | Fahrenheit | Celsius | Kelvin |
| Boiling point (water) | **212** | **100** | **373** |
| Room Temperature | **77** | **25** | **298** |
| Melting point (water) | **32** | **0** | **273** |
|  | **-148** | **-100** | 173 |
| Absolute Zero | **-459.7** | **-273** | **0** |