Thermal Energy Worksheet

1. Explain why the water in a swimming pool at 24°C has more thermal energy than a cup of boiling water at 100°C.
2. How much heat must be added to a 36.2 g sample of iron to increase its temperature by 250.0°C? The specific heat capacity of iron is 0.444 J/g°C.
3. How much heat must be added to 128.62 g of steam at 126.0°C to increase its temperature to 189.5°C? The specific heat capacity of steam is 2.010 J/g°C.
4. A 1.00 x 102 g sample of ethanol at 25.0°C is heated until it reactions 50.0°C. How much thermal energy does the ethanol gain? The specific heat capacity of ethanol is 2.44 J/g°C.
5. Beaker A contains 50 g of liquid at room temperature. The beaker is heated until the liquid increases in temperature by 10°C. Beaker B contains 100 g of the same liquid at room temperature. This beaker is also heated until the liquid increases in temperature by 10°C. In which beaker does the liquid absorb more heat? Explain your answer.
6. How much heat is released when the temperature of 789 g of liquid ammonia decrease from 82.7°C to 25.0°C? The specific heat capacity of liquid ammonia is 4.70 J/g°C.
7. A solid substance has a mass of 250.00 g. It is cooled by 25.00°C and loses 4.947 kJ of heat. What is the specific heat capacity of the substance?
8. The specific heat capacity of a compound used in fireworks is 0.8000 J/g°C. If it takes 8.04 x 103 J to heat this material from 20.0°C to 925.0°C, what mass of compound was used?
9. A piece of gold having a mass of 15.55 g is warmed to 14.7°C by the addition of 164.7 J of thermal energy. What was the initial temperature of the gold? The specific heat capacity of gold is 0.129 J/g°C.