

Phase Change Worksheet

1. a 12 oz can of soda weighs about 450 g. How many joules are released when a can of soda is cooled from 25°C (room temperature) to 4°C (the temperature of a refrigerator). **The specific heat of liquid water is 4.18 J/g °C.**
2. How many joules are required to heat 250 grams of liquid water from 0°C to 100 °C?
3. How many joules are required to melt 100 g of water? **The heat of fusion of water is 6.01 kJ/mole.**
4. How many joules are required to boil 150 grams of water? **The heat of vaporization of water is 40.67 kJ/mole.**
5. How many joules are required to heat 200 grmas of water from 25°C to 125°C? **The specific heat fo steam is 1.84 J/g°C.**
6. How many joules are given off when 120 grams of water are cooled from 25°C to -25 °C? **The specific heat of ice is 2.09 J/g°C.**
7. How many joules are required to heat 75 grams of water from -85°C to 185°C? **The specific heat of ice is 1.84 J/g°C.**
8. How many joules are required to heat a frozen can of juice (360 grams) from -5°C (the temperature of an overcooled refrigerator to 110 °C (the highest practical temperature within a microwave oven)? **HINT: note that there are phase changes and temperature changes happening.**
9. How many joules are released when 450 grams of water are cooled from 4×10^7 °C (the hottest temperatruue ever achieved by humans) to 1×10^{-9} °C (the coldest temperature achieved by humanity).
10. How many joules are required to raise the temperature of 100 grams of water from -269°C (the current temperature of space) to 1.6×10^{15} °C (the estimated temperature of space immediately after the big bang)?