

Heat Problems I

Standards:

- 3.1.10 B Describe the concepts of models as a way to predict and understand science and technology.
- 3.4.10 B Analyze energy sources and transfers of heat.

Specific Heat Capacities of some Common Substances

| Substance | Cp (J/g°C) | Substance | Cp (J/g°C) |
|--------------|------------|-------------|------------|
| Water (l) | 4.184 | Iron (s) | 0.45 |
| Water (s) | 2.03 | Mercury (l) | 0.14 |
| Water (g) | 2.0 | Carbon (s) | 0.71 |
| Aluminum (s) | 0.89 | Silver (s) | 0.24 |
| | | Gold (s) | 0.13 |

$$1\text{Cal} = 4.184\text{Joules}$$

$$1\text{kJ} = 1000\text{J}$$

Problems:

- Convert the following number of calories into joules. (Use D.A. and sig figs.)

a. $100.0\text{ cal} = \underline{\hspace{2cm}}\text{ J}$

b. $1.00 \times 10^3\text{ cal} = \underline{\hspace{2cm}}\text{ J}$

- Convert the following numbers of joules (J) into kilojoules (kJ). (Use D.A. and sig figs.)

a. $243,000\text{ J} = \underline{\hspace{2cm}}\text{ kJ}$

b. $0.251\text{ J} = \underline{\hspace{2cm}}\text{ kJ}$