

General Chemistry

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Quiz #6:

Temperature, Heat, and Specific Heat

Possibly Useful Information

$$Q = mc\Delta T \quad ^\circ\text{C} = \text{K} - 273$$

$$4.18 \text{ J} = 1 \text{ cal}$$

$$c_{\text{Fe}} = 0.45 \frac{\text{J}}{\text{g}^\circ\text{C}} \quad c_{\text{H}_2\text{O}} = 4.185 \frac{\text{J}}{\text{g}^\circ\text{C}}$$

1. Would it require more heat to increase the temperature of 10.0 g of water by 10 degrees C or would it require more heat to raise the temperature of 10.0 g of iron by 10 degrees C?

Why? water.  $\rightarrow$  It has a higher specific heat capacity.

2. A 10.0 g sample of lead was heated from 250 K to 315 K. If the specific heat of lead is 0.129 J/gK, how much heat was absorbed by the lead? Show all work.

$$q = mc\Delta T = (0.0g)(0.129 \frac{\text{J}}{\text{gK}})(315 - 250)$$

$\leftarrow 83.9 \text{ J}$

Perform the following conversions. No work needs to be shown.

3. 500  $^\circ\text{C} = \frac{713}{\text{K}}$

4. 500 K =  $\frac{227}{^\circ\text{C}}$

Perform the following conversions. Show all work.

5. 232.4 kcal =  $\frac{\text{J}}$

$$232.4 \text{ Kcal} \times \frac{1000 \text{ cal}}{1 \text{ Kcal}} \times \frac{4.18 \text{ J}}{1 \text{ cal}} =$$

$9.71 \times 10^5 \text{ J}$

6. 232.4 kJ =  $\frac{\text{cal}}$

$$232.4 \text{ kJ} \times \frac{1000 \text{ J}}{1 \text{ kJ}} \times \frac{1 \text{ cal}}{4.18 \text{ J}} = \text{cal}$$

$5.56 \times 10^4 \text{ cal}$