

Name _____ Period _____

College Prep Chemistry of the Earth System

Assignment 7D – Specific Heat of Matter

20 Points

Define the following terms based on energy of a system

Define Specific Heat (Capacity)	What defines the specific heat constant (c)?
Heat (energy) required to raise the temp 1°C for a 1 g sample of matter	A measured value for each form of matter used as a measure of specific heat.

Solve the following heat capacity problems [Specific Heat Equation: $q = c \cdot m \cdot \Delta T$]

$q = C \cdot M \cdot \Delta T$
 $\Delta T = T_{\text{final}} - T_{\text{ini}}$
 $C = \frac{J}{g \cdot ^\circ C}$
 Units
 J, kJ, cal, kcal (Cal)

$c_{Al} = 0.900 J/^\circ C$, $m_{Al} = 26.39 g$ $\Delta T = 16.38^\circ C$
$q = 0.900 J/g \cdot ^\circ C \cdot 26.39 g \cdot 16.38^\circ C$
$q = 389.04 J$ ← Unit of energy (Joules)

$c_{Ba} = 0.203 J/^\circ C$, $m_{Ba} = 39.42 g$ $\Delta T = -38.42^\circ C$
$q =$
$q =$

$c_{Fe} = 0.46 J/^\circ C$, $m_{Fe} = 29.28 g$ $\Delta T = 104.21^\circ C$
$q =$
$q =$

$c_{Pb} = 0.13 J/^\circ C$, $m_{Pb} = 43.49 g$ $\Delta T = -14.21^\circ C$
$q =$
$q =$

$c_{Ni} = 0.44 J/^\circ C$, $m_{Ni} = 8.49 g$ $T_{\text{ini}} = 29.52^\circ C$, $T_{\text{final}} = 41.42^\circ C$
$\Delta T = T_{\text{final}} - T_{\text{ini}}$
$\Delta T =$ Exo: $\Delta T = -$, lose $q (-)$ Endo: $\Delta T = +$, gain $q (+)$
$q =$
$q =$

$c_{Si} = 0.71 J/^\circ C$, $m_{Si} = 53.57 g$ $T_{\text{ini}} = 102.48^\circ C$, $T_{\text{final}} = 68.15^\circ C$
$\Delta T = T_{\text{final}} - T_{\text{ini}}$ $\Delta T = 68.15^\circ C - 102.48^\circ C$
$\Delta T = -34.33^\circ C$
$q = 0.71 J/g \cdot ^\circ C \cdot 53.57 g \cdot -34.33^\circ C$
$q = -1305.73 J$

$\Delta T = -$ $q = -$ exothermic
 For - : +/- +/-