- b speeme mean
- M = mass of the substance undergoing the temperature change
- ΔT = temperature change: $\Delta T = T_{\text{final}} T_{\text{initial}}$

Equation 5.14

- $q = C\Delta T$
- C = heat capacity
- ΔT = temperature change

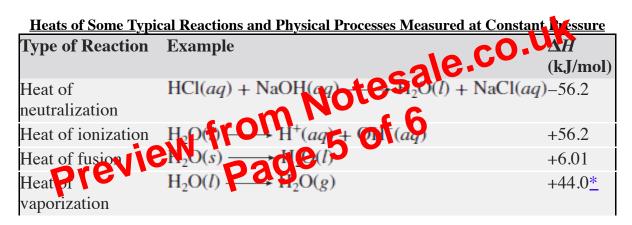
*The sign convention for q is the same as that for an enthalpy change: q is positive for endothermic processes and negative for exothermic processes

Specific freat values of Some Common Substances				
Substance	Specific Heat (J/g ·	°C)Substance	Specific Heat (J/g · °C)	
Al(s)	0.900	Fe(s)	0.444	
Au(s)	0.129	Hg(l)	0.139	
C(graphite)	0.720	$H_2O(l)$	4.184	
C(diamond)0.502	$C_2H_5OH(l)$ (ethano	ol)2.46	
Cu(s)	0.385			

Specific Heat Values of Some Common Substances

 $q_{sys} = -sm\Delta T$

Equation 5.15



$$q_{\text{surr}} = sm\Delta T$$
 $q_{\text{cal}} = -q_{\text{rxn}}$ $q_{\text{rxn}} = -q_{\text{cal}}$

 $*q_{Cal}$ and q_{rxn} are the heat changes for the calorimeter and the reaction, respectively.

Equation 5.16		$q_{\rm cal} = C_{\rm cal} \Delta T$
Equation 5.17		$q_{\rm rxn} = -C_{\rm cal}\Delta T$

*Energy content is a positive quantity.

5.5: Hess's Law

Hess's Law: the change in enthalpy that occurs when reactants are converted to products in a reaction is the same whether the reaction takes place in one step or in a series of steps *In general, we apply Hess's law by arranging a series of chemical equations (corresponding to a series of steps) in such a way that they sum to the desired overall equation.

5.6: Standard Enthalpies of Formation

Standard Enthalpy of Formation (ΔH_f°) : the heat change that results when 1 mole of a compound is formed from its constituent elements in their standard states

*The phrase "in their standard states" refers to the most stable form of an element under standard conditions, meaning at ordinary atmospheric pressure.

*The standard enthalpy of formation of any <u>element</u> in its most stable form is 0.

Standard Enthalpy of Reaction (ΔH_{rxn}°): the enthalpy of a reaction carried out under standard