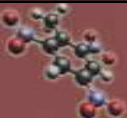


Specific Heat Capacity

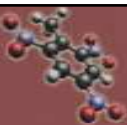
Definition
Calculations
Examples

Author: J R Reid



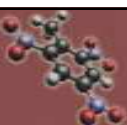
Definition

- Specific heat capacity is also known as 'specific heat'
- It is the energy required to raise 1 gram of a chemical by 1 degree Celsius
- It has a unit of $\text{J}^\circ\text{C}^{-1}\text{g}^{-1}$ (or Joules per degree Celsius per gram)
- Some substances need a lot of energy to raise their temperature, others need less:
 - Water = 4.18
 - Ethanol = 2.44
 - Lead = 0.13



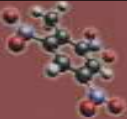
Other Examples

● Aluminium	= 0.90
● Water	= 4.18
● Carbon	= 0.72
● ethanol	= 2.44
● Copper	= 0.39
● Sulphuric acid	= 1.42
● Lead	= 0.13
● Sodium chloride	= 0.85
● Mercury	= 0.14



Calculations - Example 1

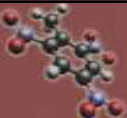
- What amount of heat energy is required to raise 20g of water by 30°C?
 - First we find the heat capacity for water
 - 4.18 J°C⁻¹g⁻¹
 - Next we multiply by the mass (in grams)
 - 4.18 x 20g = 83.6 J°C⁻¹ (Joules per degree)
 - Next we multiply by the temperature change
 - 83.6 x 30°C = 2508J (or 2.508kJ)



Calculation - Example 2

- What amount of heat energy is required to boil 30 millilitres of water from a temperature of 25°C
 - What **mass** of water will be used? (Note: 1mL of water = 1g)
 - What temperature change will be needed?

Note: Volume (litres) and amount (moles) need to be converted into grams before being used in this type of calculation



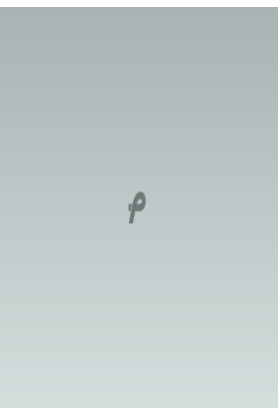
Exam Practice - 2006

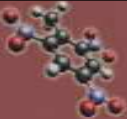
Have a go at Questions:

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