

Dulong and Petit's Law Encyclopedia Article

Dulong and Petit's Law

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Dulong and Petit's Law

In 1819, two French scientists, Pierre Dulong and Alexis Petit, proposed the first direct approach to calculating atomic weights. They proposed that the amount of **heat** required to raise the **temperature** of a single **atom** of a solid by a given amount should be independent of the type of atom. According to Dulong and Petit, then, the amount of heat required to raise the temperature of 1 gram atomic weight of a solid element by 1°C should be the constant (because 1 gram atomic weight of every element contains the same number of atoms).

Dulong and Petit 's law is usually expressed in terms of specific heat, which is the amount of heat required to raise the temperature of one gram of a substance by 1°C. In its modern form, the law says that the product of the specific heat of a solid element multiplied by its gram atomic weight should be approximately 6 cal/degree C.

In practice, Dulong and Petit's law is far from exact, with many elements showing deviations by 10% or more. Nevertheless, it does yield approximate values for the **metals** that can be refined by data from chemical analysis. It is however only employed for **solids** at high temperatures (on the order room temperature). At very low temperatures, the specific heat is proportional to the temperature raised to the third power.