

Latent heat of vaporization

The latent heat of vaporization is given by

$$\lambda = 2.501 - 0.002361 \cdot T_s$$

with the unit $[M \cdot J \cdot kg^{-1}]$, where the temperature is given in degree Celsius. This means that 2.5 million joules (J) are required to evaporate one kilogram of water. The latent heat of vaporization decreases slightly with increasing temperature. When the latent heat of vaporization is used as a constant and not as a function of temperature, the symbol L is used.

Note

A note on energy unit conversion. To convert cal to joule (J), simply multiply the value in cal with 4.1868 to obtain the value in joule. If you want to convert from Joule to cal, multiply with $1/4.1868=0.23885$.

To convert from joule (J) to kWh multiply with $2.7778 \cdot 10^{-7}$. In order to convert from kWh to joule (J), multiply with $3.6 \cdot 10^6$.

Example

On the article on energy budgets for lake evaporation a value of 590 cal/g is given. According to the conversion formula above this corresponds to $590 \cdot 4.1868 \cdot 1000 = 2,470,212$. This corresponds more or less to the above value. A value of 597.5 cal/g\$ would be needed to get a value of 2.501 MJ/kg\$.

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