Observed rotation of an optically active compound, measured using the polarimeter, depends on the experimental conditions and, therefore, is not a characteristic property of the compound. Specific rotation (symbol: $\left[\alpha\right]_\lambda^T$) of an optically active compound is defined as follows:

$$\left[\alpha\right]_\lambda^T = \frac{\alpha \text{ degrees}}{I \text{ dm} \times C \text{ g mL}^{-1}}$$

$\alpha = \text{observed rotation measured using a polarimeter}$  
$I = \text{length of sample tube}$  
$C = \text{concentration, if a solution of the compound is used for the experiment, or density, if a neat sample of the compound is used}$  
$T = \text{Temperature (usually 25 °C)}$  
$\lambda = \text{wave length of the light used (usually 589 nm)}$

Specific rotation of a compound is a characteristic property of the compound as long as the temperature, the wave length of the light, and, if a solution is used for the experiment, the solvent are specified. The units of specific rotation are degreesmLg$^{-1}$dm$^{-1}$. However, since the units of specific rotation are always the above, traditionally, specific rotation is reported without units.

eg:

$$\left[\alpha\right]_{25}^D = +43.8 \text{ (ethanol)}$$

Camphor

Contributors

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