

# What is the Usage of Experimental Thermodynamic Data of Liquids and Solutions (Such as Density, Viscosity and Refractive Index) in our Life Today?

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We can divide the usage of thermodynamic data of solutions to two sections:

## Section 1

The usage in the industry: our life today has been very dependent on things that we use such as food, drug, detergents, cosmetics and etc. These materials are produced in the various industries and the base of these industries is the physical and chemical processes. The most of these processes occur in liquid phase (solution) and the experimental thermodynamic data of these solutions (such as density, viscosity and refractive index) help us to design and control of these processes at different temperatures and pressures.

## Section 2

The usage in the scientific study: for each solution, the excess thermodynamic properties (specially excess molar volume:  $V^E$ , and viscosity deviation:  $\Delta\eta$ ) provide us the important information about interaction between molecules. For example, the negative value of  $V^E$  and positive value of  $\Delta\eta$  shows the strong interaction between molecules while positive value of  $V^E$  and negative value of  $\Delta\eta$  shows the weak interaction between molecules in solvent-solute molecules complex for each solution and for calculation of  $V^E$  and  $\Delta\eta$  we need to value of density and viscosity of solute and solvent.

Therefore, the experimental thermodynamic data of liquids and solutions is important both academically and industrially and various industries play a very important role in our life today.

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Received November 24, 2012; Accepted November 26, 2012; Published November 30, 2012

Citation: Koohyar F (2013) What is the Usage of Experimental Thermodynamic Data of Liquids and Solutions (Such as Density, Viscosity and Refractive Index) in our Life Today? J Thermodyn Catal 4: e113. doi:[10.4172/2157-7544.1000e113](https://doi.org/10.4172/2157-7544.1000e113)

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