Comparative Study of Viscosity of Binary Liquid Mixture (n-Hexane+Acetic Acid) and (n- Hexane+ Isopropyl Alcohol)

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Abstract: *For different composition of binary liquid mixtures (n-Hexane+acetic acid) and (n-Hexane +Isopropyl alcohol) viscosity is calculated and compared viscosity for composition of both binary liquid mixtures.*

Keywords: Binary liquid mixture, Density of water. Viscosity of water

1. Introduction

Hourston & hughes and Kuleznev [1] have suggested the use of ultrasonic and viscosity measurements for the investigation of compatibility of polymers blends.Paladhi and Singh [2] have pointedthat ultrasonic and miscibility. Varadaraju et al [3] have used ultrasonic refrectomectric formation of PMMA with other polymers in the blend is an important chemical process, which can be utilized in various fields of polymer research and technology. The most studied inter polymer complexes of PMMA net work have been suggested to be used as carriers of enzymes for the controlled release of drugs. Chee [4] and Sun et.al [5] have suggested the viscometry for the study of polymer-polymer miscibility. Hourstson [6] have suggested the use of sonic and viscosity measurement for miscibility determination. Singh and Singh [7] and Singh et.al [8], have pointed out that ultrasonic velocity and viscosity measurements can be used to determine the polymer-polymer miscibility.

For the measurement of intrinsic viscosity ,polynomial relations have been suggested by various investigators[9].The coefficient of these equation the polynomial solvent interaction and polymer-polymer interaction. A correlation between the huggin's coefficients and the constant describing the solvated part has been reported[10-13].

In this paper we have measured density of binary liquid mixture , calculated viscosity ,results shown in tables and figures drown composition of binary liquid mixtures vs. viscosity .

2. Formula Used

Viscosity of different composition of liquid mixtures calculated using the formula

$\eta_1 / \eta_2 = \rho_1 t_1 / \rho_2 t_2$

$\eta_2 = \eta_1 \rho_2 t_2 / \rho_1 t_1$

Where ρ_1 is the density of water , η_1 is the viscosity of water, t_1 is the time for flowing water through viscometer, while ρ_2 is

density of binary liquid mixture ,t_2 is the time for flowing liquid mixture through viscometer and η_2 is the viscosity of liquid mixture.

3. Observation

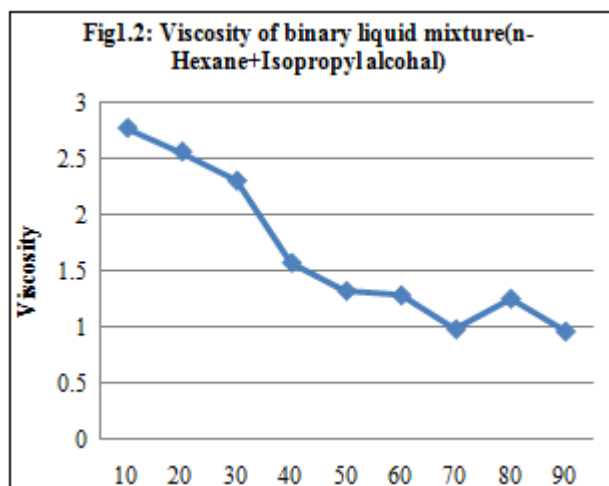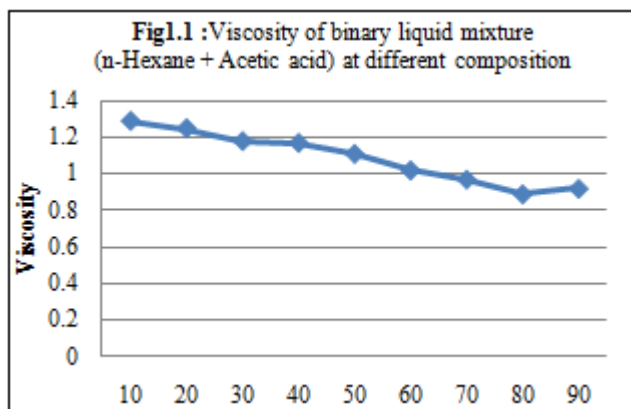**Viscosity measurement table of binary liquid mixture(n-Hexane+ Acetic acid)**

Table 1.1

Binary liquid mixture composition(volume) n-Hexane% Acetic acid%	Viscosity (poise)10^{-2}
10 90	1.29
20 80	1.25
30 70	1.18
40 60	1.17
50 50	1.11
60 40	1.02
70 30	0.97
80 20	0.89
90 10	0.92

Viscosity measurement table of binary liquid mixture(n-Hexane+Isopropyl alcohol)

Table 1.2

Binary liquid mixture composition(volume) n-Hexane% Isopropyl alcohol%	Viscosity (poise)10^{-2}
10 90	2.78
20 80	2.57
30 70	2.31
40 60	1.58
50 50	1.33
60 40	1.29
70 30	.989
80 20	1.26
90 10	.968

Fig1.1 : Viscosity of binary liquid mixture (n-Hexane + Acetic acid) at different composition

Fig1.2: Viscosity of binary liquid mixture(n-Hexane+Isopropyl alcohal)

4. Result and Discussion

The observations for viscosity are summarized in table1.1,table1.2 and figure1.1 ,figure1.2. From the tables and figures it observed that the viscosity of binary liquid mixtures is decreasing as increasing the composition of n-Hexane in acetic acid. Viscosity of binary liquid mixture is also decreasing as increasing the composition of n-Hexane in Isopropyl alcohol. The viscosity of composition of n-Hexane in acetic acid is less than the composition of n-Hexane in Isopropyl alcohol and decreasing rate of viscosity in composition of n-Hexane in Isopropyl alcohol is more than the composition of n-Hexane in acetic acid. It means in both the composition of binary liquid mixtures the number of carbon and Hydrogen atom somewhere affecting the viscosity. These parameters may be useful for analysis of the properties and application point of view of the liquid mixtures.

5. Acknowledgement

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