



Research Article

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Refractometric study of the binary mixture of benzene and carbon tetrachloride

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ABSTRACT

First of all author got the data of refractive index of benzene and carbon tetrachloride by various propositional of benzene and carbon tetra chloride. Then after got the value of Lorenz and Lorentz equation & also developed new DDJ equation, then compare L&L vs. DDJ eqⁿ.

Keywords: Refractometer, Binary mixture, Benzene and Carbon tetrachloride

INTRODUCTION

The measurement of refractive index and optical activity of organic liquids is of great importance in chemistry. These measurement provide invaluable information regarding the molecular structure, purity of organic compounds and the composition of binary mixtures[1]. Moreover, electronic structure computations are widely used in understanding and design of molecules exhibiting linear or nonlinear. Other high frequency depended properties such as the refractive index has been less extensively explored, even when it is used for experimental and theoretical aspects more frequently [2-13].

EXPERIMENTAL SECTION

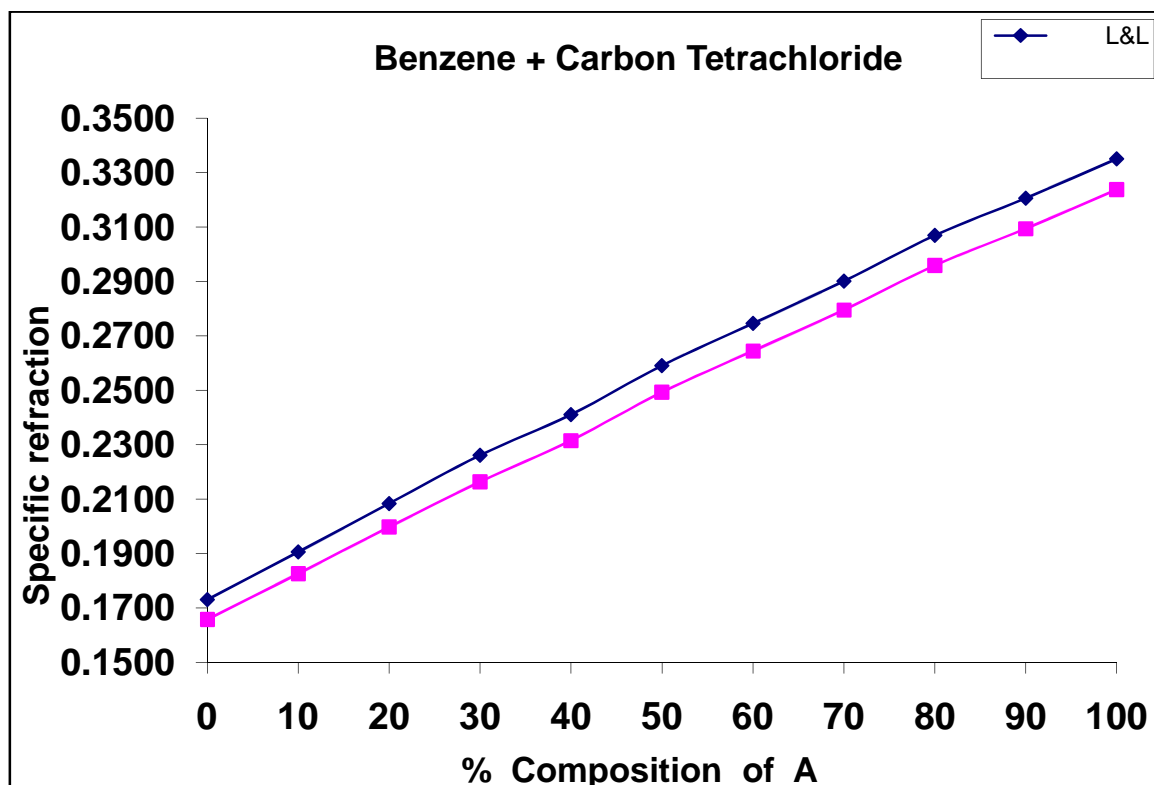
The reagent grade chemicals were obtained from commercial sources and purified by either distillation or recrystallization before use. Following table provide information of % composition of benzene and carbon tetrachloride, refractive index, L&L, and also developed DDJ formula and at last difference of L&L and DDJ.

Table-1 Benzene + Carbon Tetrachloride(A= Benzene, B=Carbon Tetrachloride)

Sr. No.	% A	% B	d gm/cm ³	Refractive index n	$R = \frac{n^2 - 1}{n^2 + 2} \cdot \frac{1}{d}$ L & L	$R = \frac{0.0843}{1.0251} \times (n^3 - 0.0045)$ DDJ	Diff. R ₁ -R ₂
1	0	100	1.5940	1.464	0.1731	0.1657	0.0074
2	10	90	1.4560	1.467	0.1906	0.1825	0.0080
3	20	80	1.3415	1.471	0.2084	0.1997	0.0086
4	30	70	1.2110	1.460	0.2262	0.2163	0.0098
5	40	60	1.1760	1.479	0.2411	0.2316	0.0095
6	50	50	1.1060	1.485	0.2591	0.2493	0.0099
7	60	40	1.0527	1.490	0.2746	0.2645	0.0101
8	70	30	1.9980	1.491	0.2902	0.2796	0.0106
9	80	20	1.9468	1.493	0.3070	0.2959	0.0110
10	90	10	1.9125	1.497	0.3207	0.3095	0.0112
11	100	0	1.8792	1.501	0.3351	0.3238	0.0113

Table-2 Verification from Q test

Symbol	Values in increasing order	Q1	Q2
		0.1355	0.1071
M1	0.1825	$Q1=(M2-M1)/(M9-M1)$ $Q2=(M9-M8)/(M9-M1)$ Values of Q1 and Q2 are less then 95% confidential level. Therefore all values are acceptable.	
M2	0.1825		
M3	0.1825		
M4	0.1825		
M5	0.1825		
M6	0.1825		
M7	0.1825		
M8	0.1825		
M9	0.1825		



RESULTS AND DISCUSSION

The graph of percentage composition of liquid A against specific refraction of binary mixture solutions are plotted for every system. The observed curves were classified in three categories.

1. Straight line curves or ideal system
2. Positive and negative deviation curves
3. Wave type curves or unsymmetrical curves

CONCLUSION

In benzene and carbon tetrachloride, straight line curved are indicates that the both component behaving ideally at any concentration. This type of all the system obey Raoult's law. In other words system were called completely miscible binary liquid mixture.

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