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Comparative refractometric study of the binary mixture of carbon tetrachloride and chloro benzene between L&L and DDJ Formula

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ABSTRACT

First of all author got the data of refractive index of benzene and carbon tetrachloride by various propositional of carbon tetra chloride and chloro benzene. Then after got the value of Lorenz and Lorentz equation & also developed new DDJ(Damor, Desai, Joshi) equation, then compare L & L vs. D D J eq^n.

Keywords: Refractometer, Binary mixture, Carbon tetrachloride and chloro benzene, L & L

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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 [2-9].
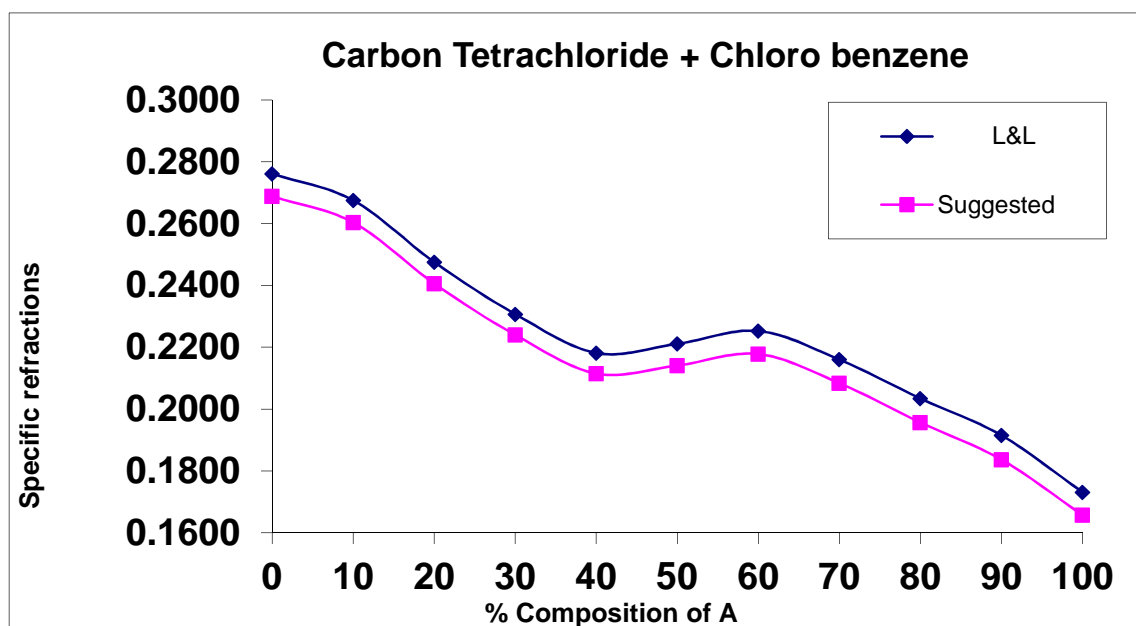
MATERIALS AND METHODS

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 carbon tetrachloride and chloro benzene, refractive index, L&L, and also developed DDJ formula and at last difference of L&L and DDJ.

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

Sr. No.	% A	% B	d gm/cm^3	Refractive index n	R_1 $R=\dfrac{n^2-1}{n^2+2}\cdot\dfrac{1}{d}$ L&L	R_2 $R=\dfrac{0.0843}{d}\times(n^3-0.0045)$ DDJ	Diff. R_1-R_2
1	0	100	1.1062	1.523	0.2762	0.2689	0.0073
2	10	90	1.1400	1.522	0.2675	0.2604	0.0072
3	20	80	1.2239	1.518	0.2476	0.2406	0.0070
4	30	70	1.3070	1.515	0.2307	0.2240	0.0067
5	40	60	1.3733	1.511	0.2181	0.2115	0.0067
6	50	50	1.3460	1.507	0.2211	0.2141	0.0070
7	60	40	1.3123	1.503	0.2253	0.2178	0.0074
8	70	30	1.3500	1.495	0.2160	0.2084	0.0076
9	80	20	1.4090	1.485	0.2034	0.1957	0.0077
10	90	10	1.4650	1.473	0.1915	0.1836	0.0078
11	100	0	1.5940	1.464	0.1731	0.1657	0.0074

Table-2 Verification from Q test

Symbol	Values in increasing order	Q1	Q2
		0.1565	0.2575
M1	0.1836		
M2	0.1957		
M3	0.2084		
M4	0.2115	Q1=(M2-M1)/(M9-M1)
M5	0.2141	Q2=(M9-M8)/(M9-M1)
M6	0.2178	Values of Q1 and Q2 are less then 95% confidential level. Therefore all values are acceptable.
M7	0.2240		
M8	0.2406		
M9	0.2604		

Carbon Tetrachloride + Chloro benzene

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 carbon tetrachloride and chloro benzene, waye type curved are indicates that the both component behaving irregularly at any concentration. This type of all the system obey Raoults law. In other words system were called completely miscible binary liquid mixture.

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