

DENSITIES OF ALLYL ALCOHOL, METHYL-ETHYL KETONE AND TOLUENE AT LOW TEMPERATURES.

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The densities of allyl alcohol, methyl-ethyl ketone, and toluene at low temperatures were determined by the sealed pycnometer method which was reported by the same authors in this Bulletin.⁽¹⁾ All the materials used in this experiment were Kahlbaum pure chemicals purified according to the usual methods.

The boiling points of the samples were as follows.

Allyl alcohol	Methyl-ethyl ketone	Toluene
96.5°—96.6° C / 755.0 mm.	79.4° C / 751 mm.	110.2° C / 753.1 mm.

The experimental results are shown in Tables 1, 2, and 3 and accompanying figure. Table 4 contains the densities at temperatures of round

Table 1. Densities of Allyl Alcohol.

Temp. (°C)	Density (obs.)	Density (calc.)	Pycnometer
0.00	0.87042		2 and 6
—10.43	0.87980	0.87959	6
—19.03	0.88739	0.88720	2
—21.40	0.88966	0.88930	6
—26.87	0.89457	0.89417	2
—40.13	0.90607	0.90606	2
—43.96	0.90974	0.90951	6
—48.54	0.91377	0.91365	2
—52.75	0.91746	0.91746	6
—59.12	0.92362	0.92327	2 and 6
—59.50	0.92402	0.92362	6
—65.78	0.92943	0.92936	2 and 6
—66.33	0.93020	0.92986	6
—68.60	0.93230	0.93194	6
—80.08	0.94260	0.94250	6

$$D = 0.87042 - 0.0008756t + 0.00000309t^2$$

(1) This Bulletin, 6 (1931), 118.

Table 2. Densities of Methyl-ethyl Ketone

Temp. (°C)	Density (obs.)	Density (calc.)	Pycnometer
0.00	0.82591		6 and 8
-14.41	0.83996	0.84007	8
-19.91	0.84503	0.84544	5
-25.50	0.85064	0.85089	5
-29.36	0.85454	0.85464	2 and 6
-30.70	0.85623	0.85594	5
-35.29	0.86070	0.86039	2 and 8
-37.58	0.86277	0.86259	5
-37.73	0.86288	0.86274	2 and 8
-37.95	0.86317	0.86296	2, 6 and 8
-45.37	0.87056	0.87011	5
-50.36	0.87521	0.87490	6 and 8
-55.35	0.88011	0.87968	5
-60.24	0.88481	0.88435	5
-62.03	0.88605	0.88606	6 and 8
-65.03	0.88924	0.88891	5
-77.83	0.90063	0.90103	5

$$D = 0.82591 - 0.0009866t - 0.000000274t^2$$

Table 3. Densities of Toluene.

Temp. (°C)	Density (obs.)	Density (calc.)	Pycnometer
0.00	0.88418		2, 6 and 8
-11.70	0.89618	0.89670	2, 6 and 8
-13.86	0.89830	0.89782	2, 6 and 8
-19.60	0.90368	0.90341	2, 6 and 8
-28.25	0.91170	0.91178	2, 6 and 8
-35.17	0.91825	0.91842	2, 6 and 8
-42.49	0.92491	0.92539	2, 6 and 8
-52.50	0.93423	0.93479	2, 6 and 8
-62.73	0.94393	0.94439	2, 6 and 8
-70.38	0.95132	0.95142	2 and 8
-79.41	0.95986	0.95978	2, 6 and 8
-89.27	0.96928	0.96874	8

$$D = 0.88418 - 0.0009906t - 0.000000487t^2$$

Table 4. Densities.

Temp. (°C)	Allyl alcohol	Methyl-ethyl ketone	Toluene
0.00	0.87042	0.82591	0.88418
-5.00	0.87481	0.83083	0.88912
-10.00	0.87921	0.83574	0.89404
-15.00	0.88362	0.84065	0.89893
-20.00	0.88805	0.84553	0.90380
-25.00	0.89250	0.85040	0.90864
-30.00	0.89697	0.85526	0.91346
-35.00	0.90145	0.86010	0.91825
-40.00	0.90594	0.86493	0.92303
-45.00	0.91045	0.86975	0.92777
-50.00	0.91497	0.87455	0.93249
-55.00	0.91951	0.87936	0.93719
-60.00	0.92407	0.88411	0.94186
-65.00	0.92864	0.88888	0.94651
-70.00	0.93323	0.89362	0.95114
-75.00	0.93783	0.89836	0.95574
-80.00	0.94245	0.90307	0.96031
-85.00	—	—	0.96486
-90.00	—	—	0.96939

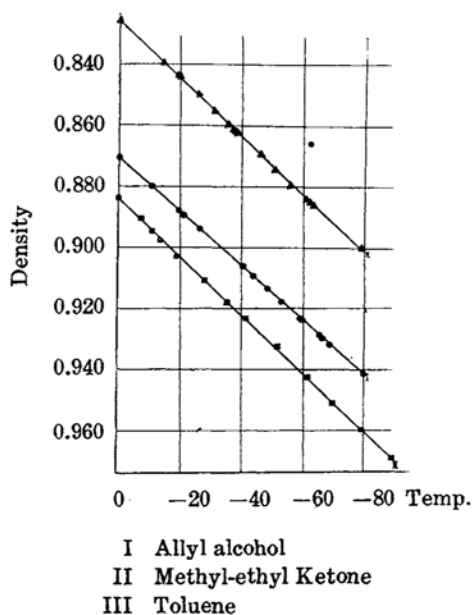


Fig. 1.

numbers, calculated by the empirical equations obtained by the least square method with the observed values.

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