

Supporting Information

Thermal and Volumetric Properties of Some C5 and C6 Alkanones at Infinite Dilution in Water

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FIGURE S1

Comparison of density of 2-pentanone measured as a function of temperature in this work with literature values: ■, Grolier et al.,¹ (1975); ●, Malhotra & Woolf,² (1996); ▲, Domanska & Lachwa,³ (2002); ▼, Romero et al.,⁴ (2002); ◆, Gonzalez et al.,⁵ (2005); ▲, Krishna et al.,⁶ (2009); ★, TRC,⁷ (1994).

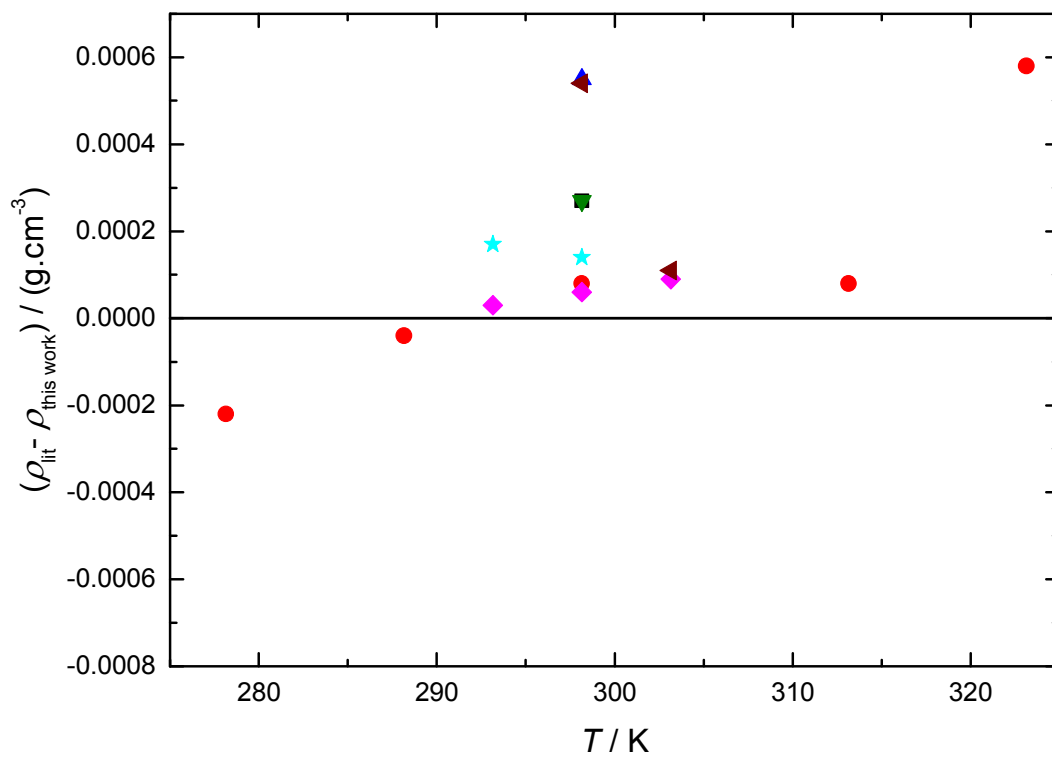


FIGURE S2

Comparison of density of 3-pentanone measured as a function of temperature in this work with literature values: $\square$, Fermeglia et al.,⁸ (1990); $\circ$, Malhotra et al.,⁹ (1993); $\blacksquare$, Lee & Chuang,¹⁰ (1997); $\blacktriangle$, Domanska & Lachwa,² (2002); $\blacktriangledown$, Romero et al.,⁴ (2002); $\blacklozenge$, Krishna et al.,⁶ (2009); $\blacktriangleleft$, Rathnam et al.,¹¹ (2010); $\star$, TRC,⁷ (1994).

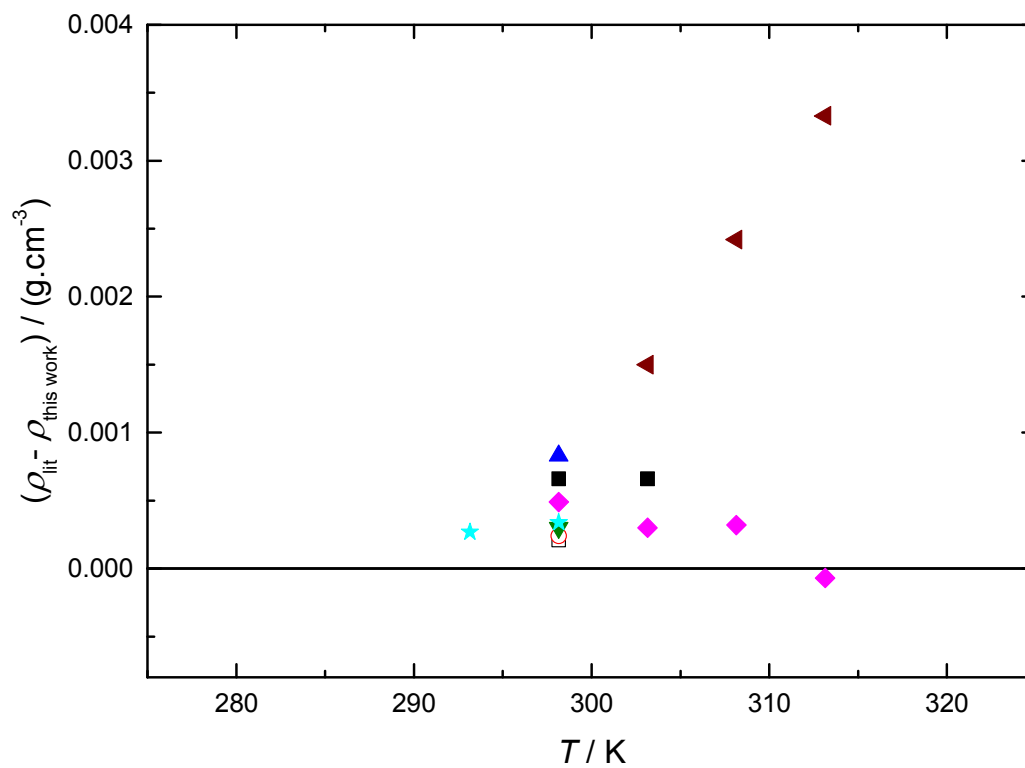


FIGURE S3

Comparison of density of 3-methyl-2-butanone measured as a function of temperature in this work with literature values: ■, Paschke et al.,¹² (1993); ●, Chen et al.,¹³ (1996); ▲, Psutka & Wichterle,¹⁴ (2005); ★, TRC,⁷ (1994).

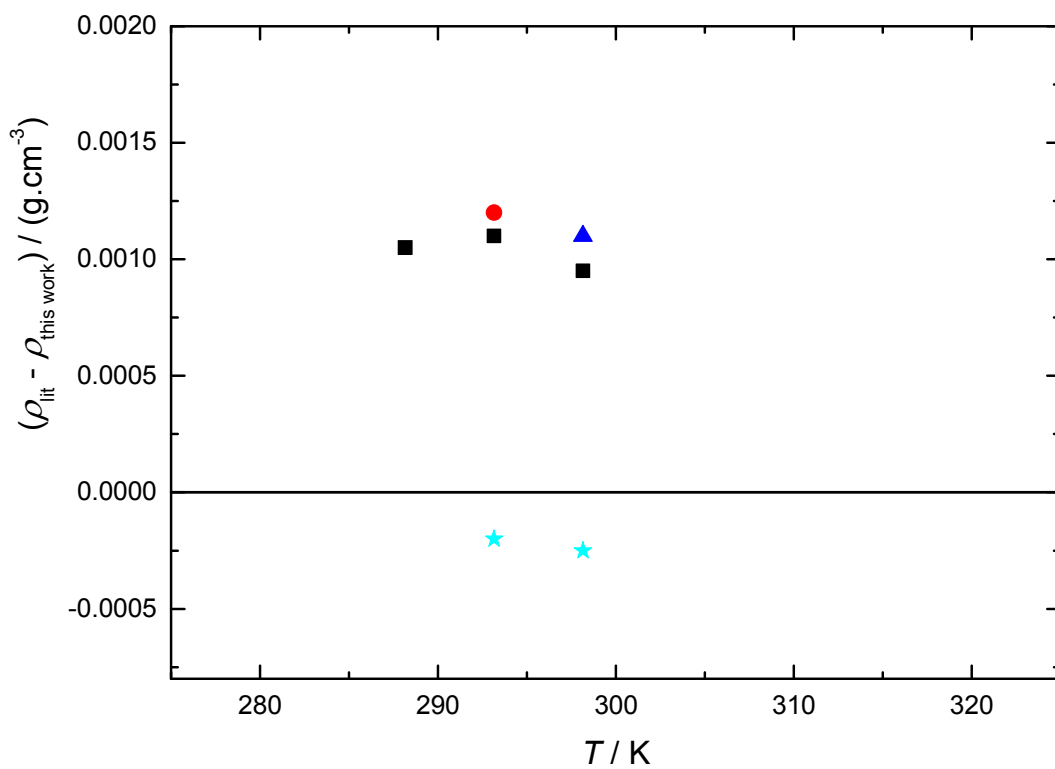


FIGURE S4

Comparison of density of 2-hexanone measured as a function of temperature in this work with literature values: ■, Fermeglia et al.,⁸ (1990); ●, Lorenzana et al.,¹⁵ (1994); ▲, Malhotra & Woolf,² (1996); ▼, Domanska & Lachwa,³ (2002); ★, TRC,⁷ (1994).

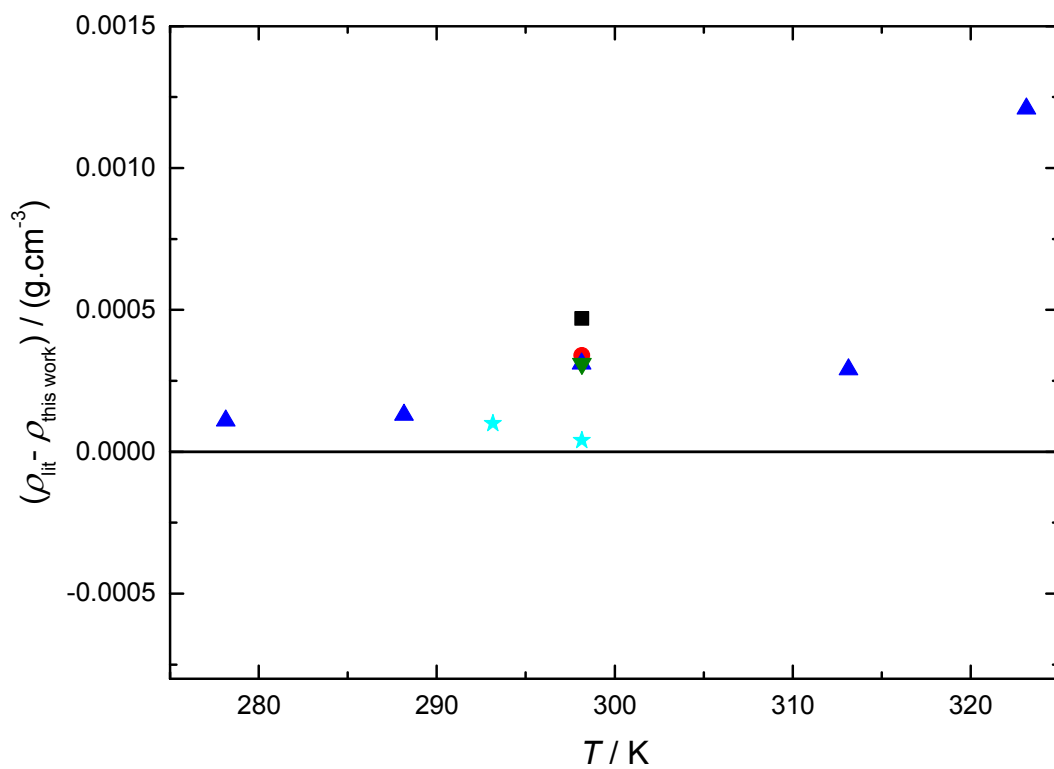
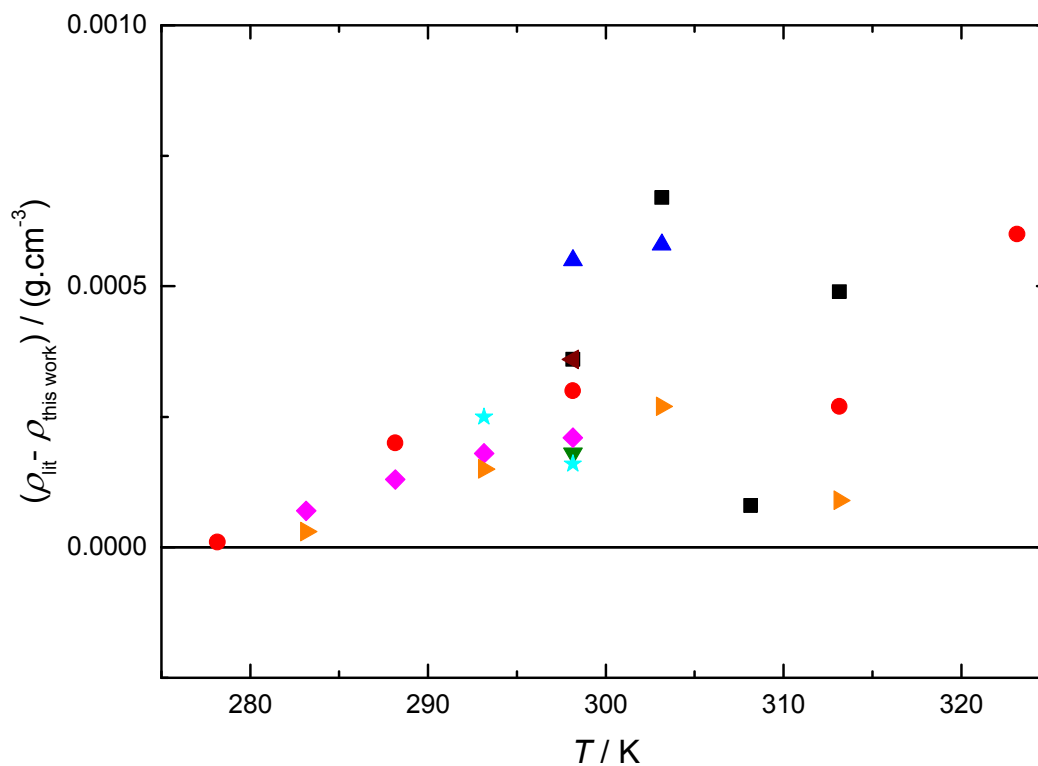


FIGURE S5

Comparison of density of 4-methyl-2-pentanone measured as a function of temperature in this work with literature values: ■, Riggio et al.,¹⁶ (1986); ●, Malhotra & Woolf,² (1996); ▲, Lee & Chuang,¹⁰ (1997); ▼, Domanska & Lachwa,³ (2002); ◆, Gonzalez et al.,¹⁷ (2002); ◆, Prasad et al.,¹⁸ (2005); ►, Clara et al.,¹⁹ (2007); ★, TRC,⁷ (1994).



References

- (1) Grolier, J. P. E.; Benson, G. C.; Picker, P., Simultaneous measurements of heat capacities and densities of organic liquid mixtures. Systems containing ketones. *J. Chem. Eng. Data* **1975**, *20*, 243-246.
- (2) Malhotra, R.; Woolf, L. A., Volumetric measurements of liquid pentan-2-one, hexan-2-one, and 4-methylpentan-2-one at temperatures from 278.15 K to 338.13 K and pressures in the range from 0.1 MPa to 386 MPa. *J. Chem. Thermodyn.* **1996**, *28*, 1411-1421.
- (3) Domańska, U.; Łachwa, J.; Letcher, T. M., Densities, Excess Molar Volumes, and Excess Molar Enthalpies of (N-Methyl-2-pyrrolidinone + Ketone) at T = 298.15 K. *J. Chem. Eng. Data* **2002**, *47*, 1446-1452.
- (4) Romero, T.; Riesco, N.; Villa, S.; García de La Fuente, I.; González, J. A.; Cobos, J. C., Excess molar volumes at 298.15 K of binary liquid organic mixtures containing n-alkanones and linear ethers: Application of Flory's theory. *Fluid Phase Equilib.* **2002**, *202*, 13-27.
- (5) González, B.; Domínguez, Á.; Tojo, J., Dynamic Viscosities of the Binary Systems Cyclohexane and Cyclopentane with Acetone, Butanone, or 2-Pentanone at Three Temperatures T = (293.15, 298.15, and 303.15) K. *J. Chem. Eng. Data* **2005**, *50*, 1462-1469.
- (6) Krishna, P. M.; Kumar, B. R.; Sathyanarayana, B.; Kumar, K. S.; Satyanarayana, N., Densities and Speeds of Sound for Binary Liquid Mixtures of Thiolane-1,1-dioxide with Butanone, Pentan-2-one, Pentan-3-one, and 4-Methyl-pentan-2-one at T = (303.15 or 308.15 or 313.15) K. *J. Chem. Eng. Data* **2009**, *54*, 1947-1950.
- (7) TRC Thermodynamic Tables – Non-hydrocarbons. Thermodynamic Research Center: College Station, TX, 1994.
- (8) Fermeglia, M.; Lapasin, R.; Torriano, G., Excess volumes and viscosities of binary systems containing 4-methyl-2-pentanone. *J. Chem. Eng. Data* **1990**, *35*, 260-265.
- (9) Malhotra, R.; Price, W. E.; Woolf, L. A., Thermodynamic properties of pentan-3-one at temperatures from 278 K to 338 K and pressures from 0.1 MPa to 380 MPa. *J. Chem. Thermodyn.* **1993**, *25*, 361-366.
- (10) Lee, L.-s.; Chuang, M.-l., Excess Volumes of Cyclohexane with 2-Propanone, 2-Butanone, 3-Pentanone, 4-Methyl-2-pentanone, 1-Propanol, and 2-Propanol and Ethanoic Acid + 1-Propanol Systems. *J. Chem. Eng. Data* **1997**, *42*, 850-853.
- (11) Rathnam, M. V.; Mohite, S.; Kumar, M. S., Densities, Viscosities, and Refractive Indices of Binary Mixtures of Diethyl Oxalate with Some Ketones at (303.15, 308.15, and 313.15) K. *J. Chem. Eng. Data* **2010**, *55*, 5946-5952.
- (12) Paschke, A.; Thiel, P.; Winkelmann, J., Measurement of diffusion, viscosity, and density in a new MIPK BUAC H₂O test system. *Chem. Ing. Tech.* **1993**, *65*, 949-951.
- (13) Chen, C.-C.; Tang, M.; Chen, Y.-P., Vapor–Liquid Equilibria of Binary and Ternary Mixtures of Cyclohexane, 3-Methyl-2-Butanone, and Octane at 101.3 kPa. *J. Chem. Eng. Data* **1996**, *41*, 557-561.

- (14) Psutka, S.; Wichterle, I., Vapor–Liquid Equilibria in the Binary and Ternary Systems Composed of 2-Methylpentane, 3-Methyl-2-butanone and 3-Methyl-2-butanol. *J. Chem. Eng. Data* **2005**, *50*, 1338-1342.
- (15) Lorenzana, M. T.; Franjo, C.; Jiménez, E.; Baluja, M. C.; Fernández, J., Alkyl-chain-length dependence of the excess volumes for (an α,ω -dichloroalkane + an alkan-2-one). *J. Chem. Thermodyn.* **1994**, *26*, 809-815.
- (16) Riggio, R.; Martinez, H. E.; Solimo, H. N., Densities, viscosities, and refractive indexes for the methyl isobutyl ketone + pentanols systems. Measurements and correlations. *J. Chem. Eng. Data* **1986**, *31*, 235-238.
- (17) González, C.; Resa, J. M.; Lanz, J.; Fanega, M. A., Properties of Mixing of Systems that Contain Sunflower Oil with Ketones. *J. Chem. Eng. Data* **2002**, *47*, 1116-1122.
- (18) Prasad, T. E. V.; Vallinatha Sarma, A.; Sudhindra, B. V.; Veerendra, G.; Venugopalachary, K.; Prasad, D. H. L., Bubble temperature measurements on seven binary mixtures formed by ethylbenzene at 94.7 kPa. *J. Chem. Thermodyn.* **2005**, *37*, 758-761.
- (19) Clará, R. A.; Gómez Marigliano, A. C.; Sólomo, H. N., Density, viscosity, isothermal (vapour + liquid) equilibrium, excess molar volume, viscosity deviation, and their correlations for chloroform + methyl isobutyl ketone binary system. *J. Chem. Thermodyn.* **2007**, *39*, 261-267.