# Volumetric properties of dilute aqueous solutions of D-ribose to 50 MPa and 413.15 K

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D-ribose is an essential biomolecule, a monosaccharide that forms part of the backbone of RNA and is related to deoxyribose found in DNA. The volumetric properties of dilute aqueous solutions of ribose were measured using an Anton Paar DMA HP vibrating tube densimeter. Reproducibility of the density measurements was $<\pm 0.0001$ g·mol^{-3}. Figure 1 shows that there is excellent agreement between our experimentally determined partial molar volumes at infinite dilution (V^∞) of D-ribose and values previously published [1-5]. Fig. 1 shows that V^∞ varies as a function of T but is relatively insensitive to P up to 50.0 MPa. We note that these data signifcantly extend the experimental database for D-ribose to 413.13 K at a range of pressures. These data provide constraints on the stability of biomolecules at elevated temperatures and pressures.
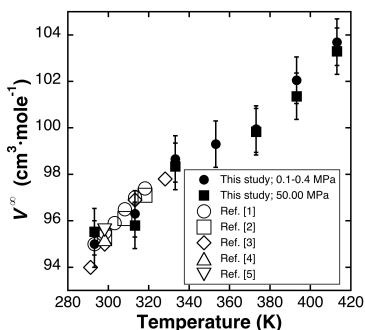
Figure 1. Experimentally determined values of V^∞ of D-ribose in aqueous solutions at 293.15-413.15 K and 0.10 MPa (slightly higher P at T $\geq$373.15K) and 50.00 MPa from this study and V^∞ from previous studies at pressures near 0.10 MPa. The error bars represent the estimated uncertainty of ± 1.0 cm^3·mol^{-1}

[1] Paljk *et al* (1990) *J. Chem. Eng. Data* **35**, 41-43. [2] Banipal *et al* (1997) *J. Chem. Soc. Faraday Trans.* **93**, 81-87. [3] Chalikian (1998*) J. Phys. Chem. B* **102**, 6921-6926. [4] Uedaira (1985) *J. Sol. Chem.* 14, 27-34. [5] Jasra & Ahluwalia (1984) *J. Chem. Thermodynam.* **16**, 583-590.