

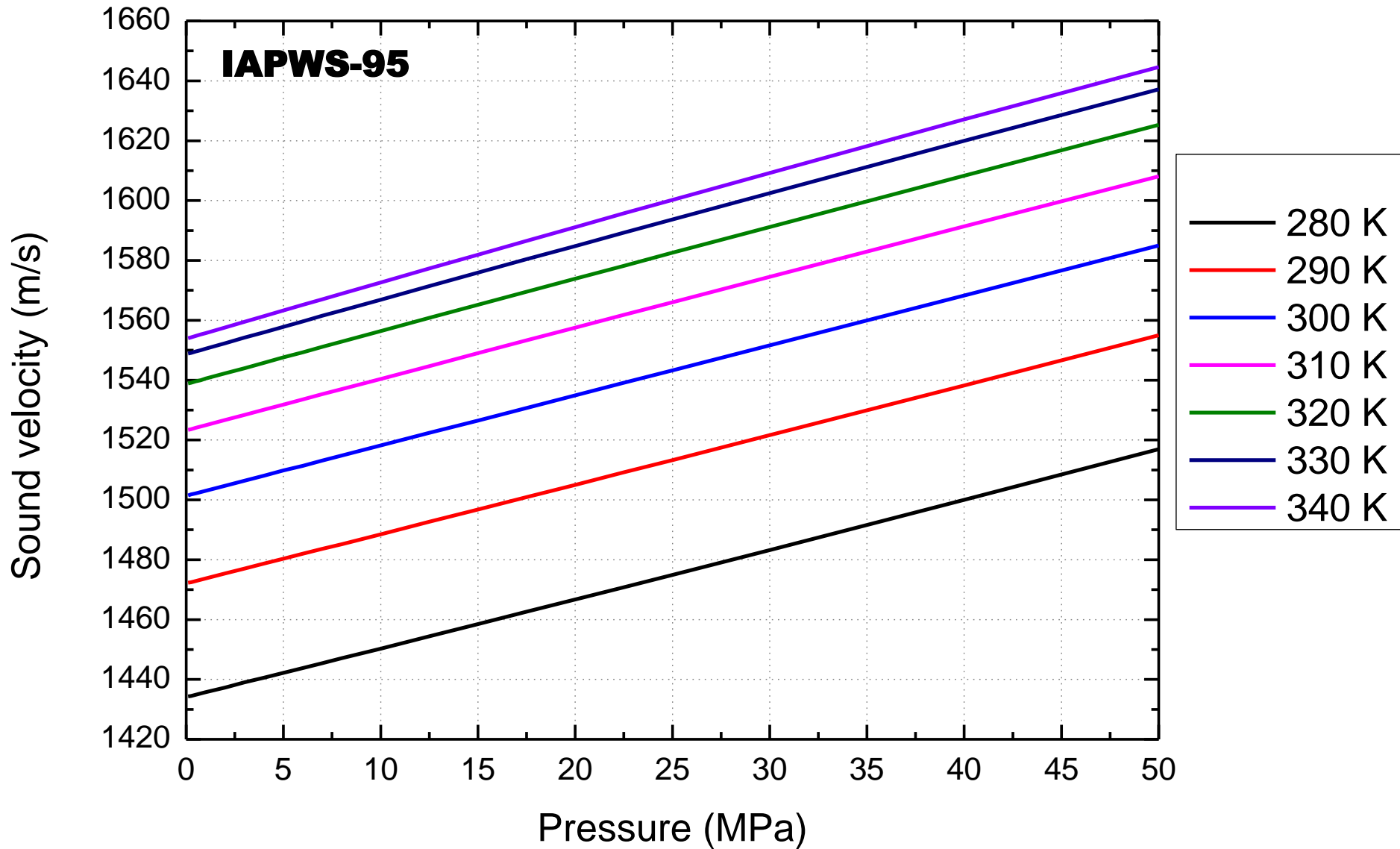
Thermodynamic data of water

$280 \text{ K} < T < 340 \text{ K}$

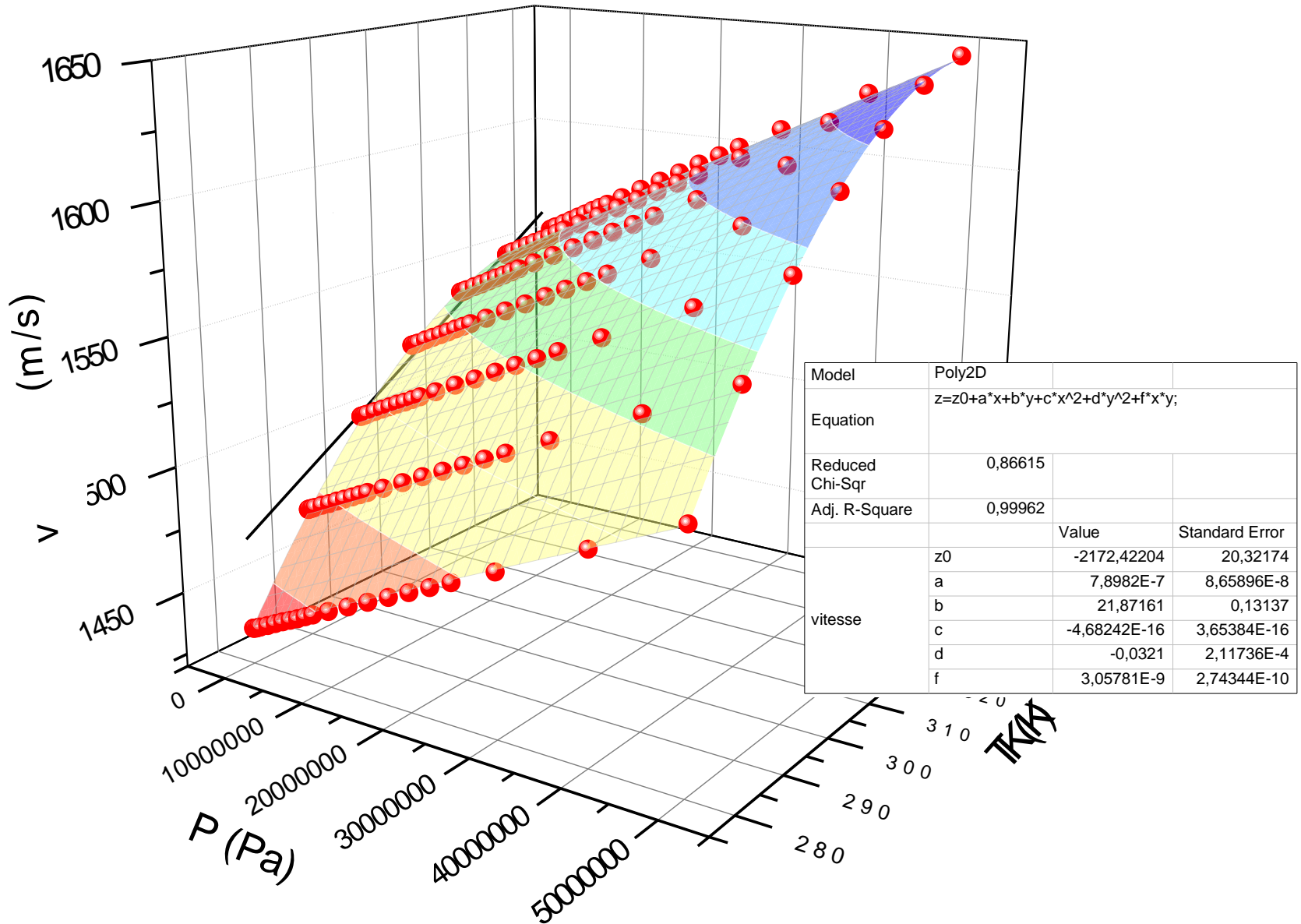
$0 \text{ Pa} < P < 50 \text{ Mpa}$

References : Wagner & Pruss (2002) IAPWS-95

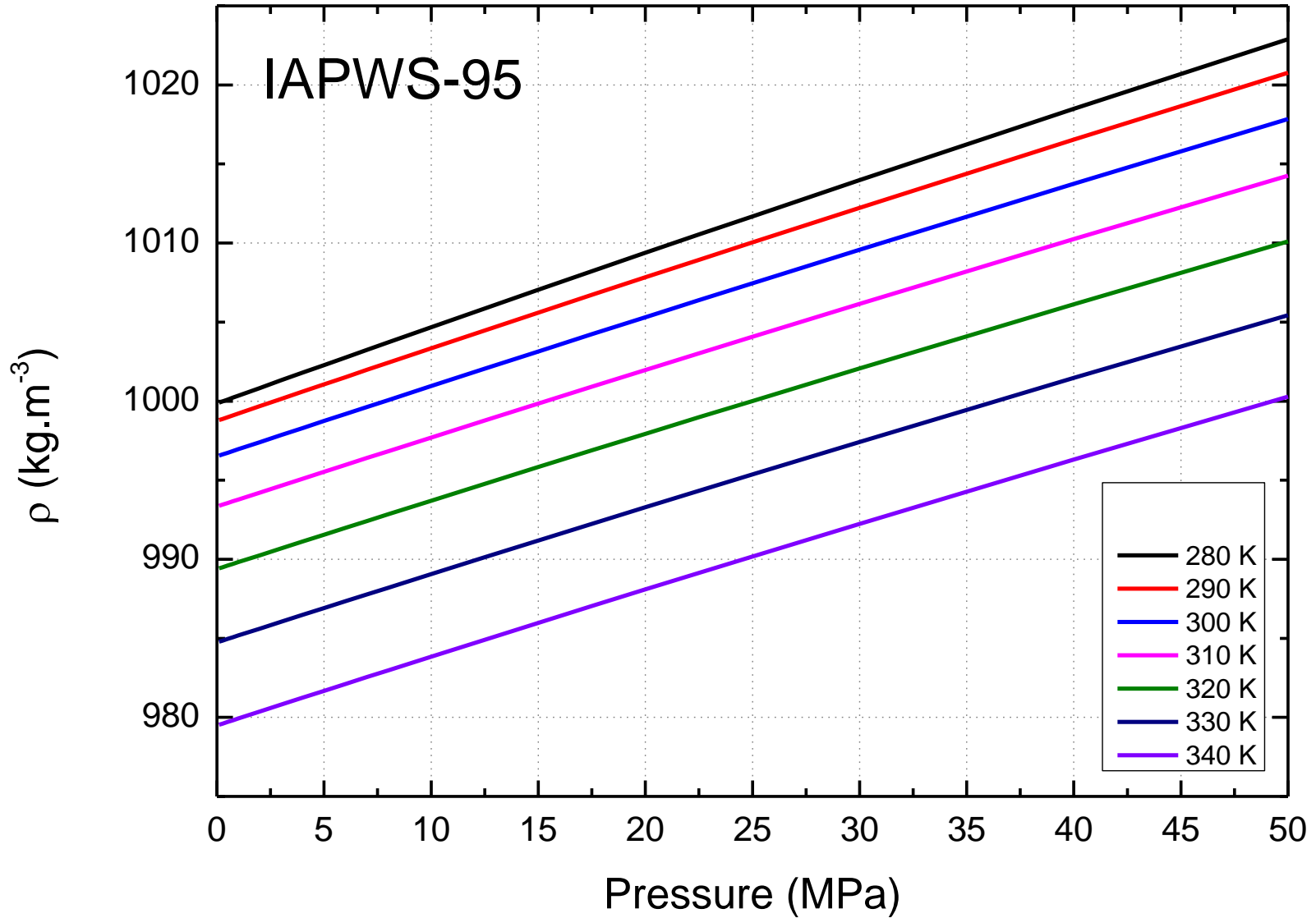
Sound velocity



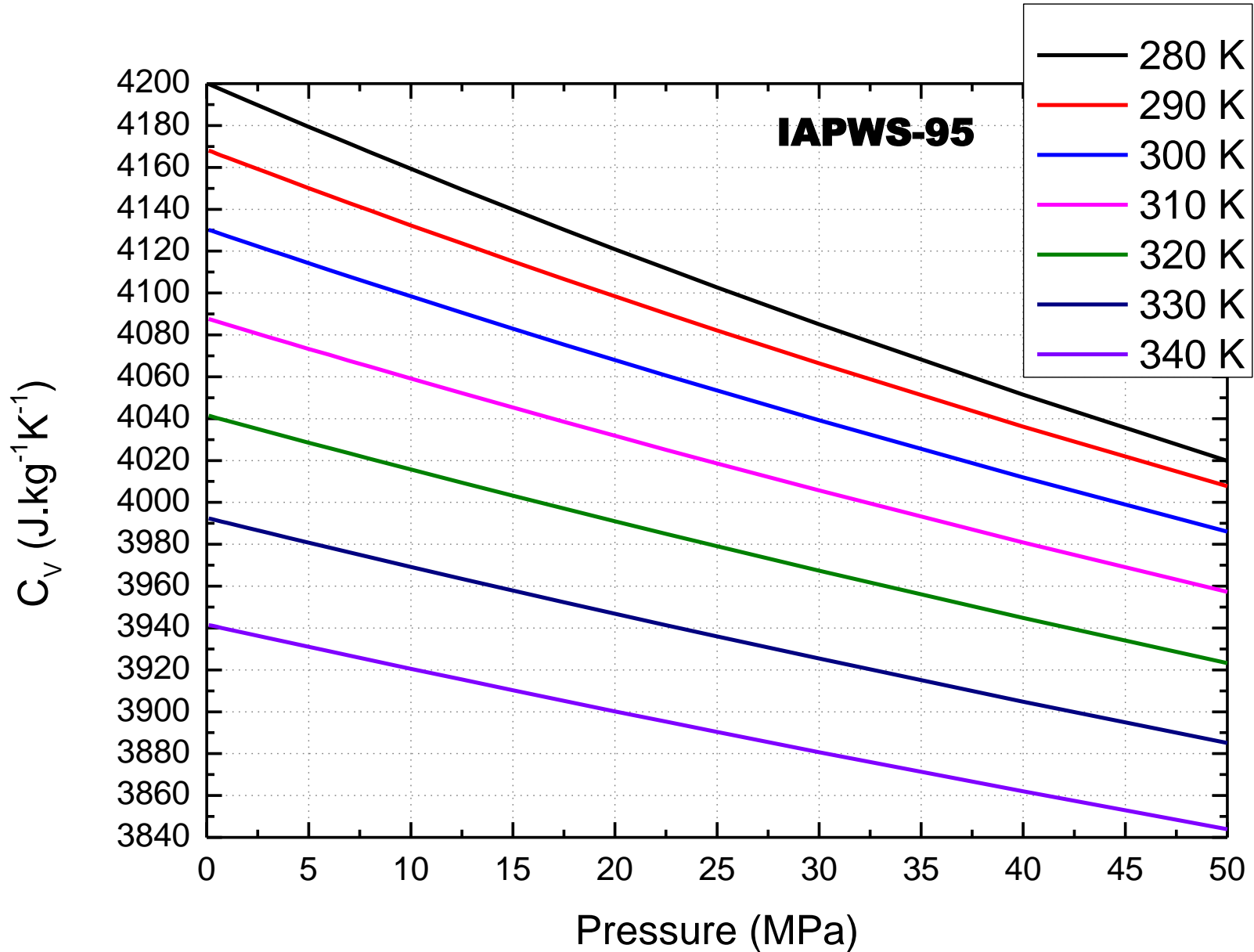
Polynomial representation of sound velocity (ORIGIN software)



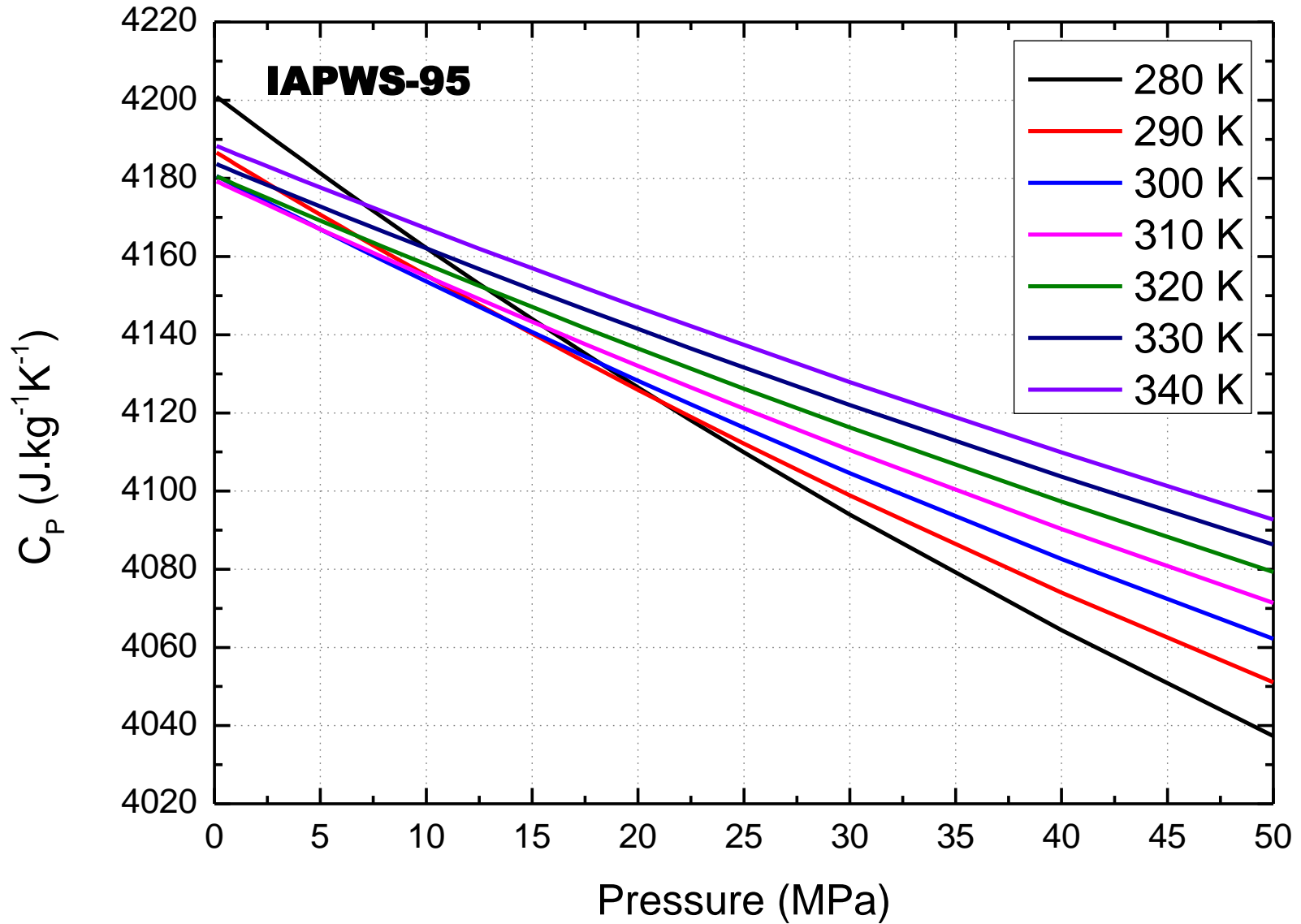
Density ρ



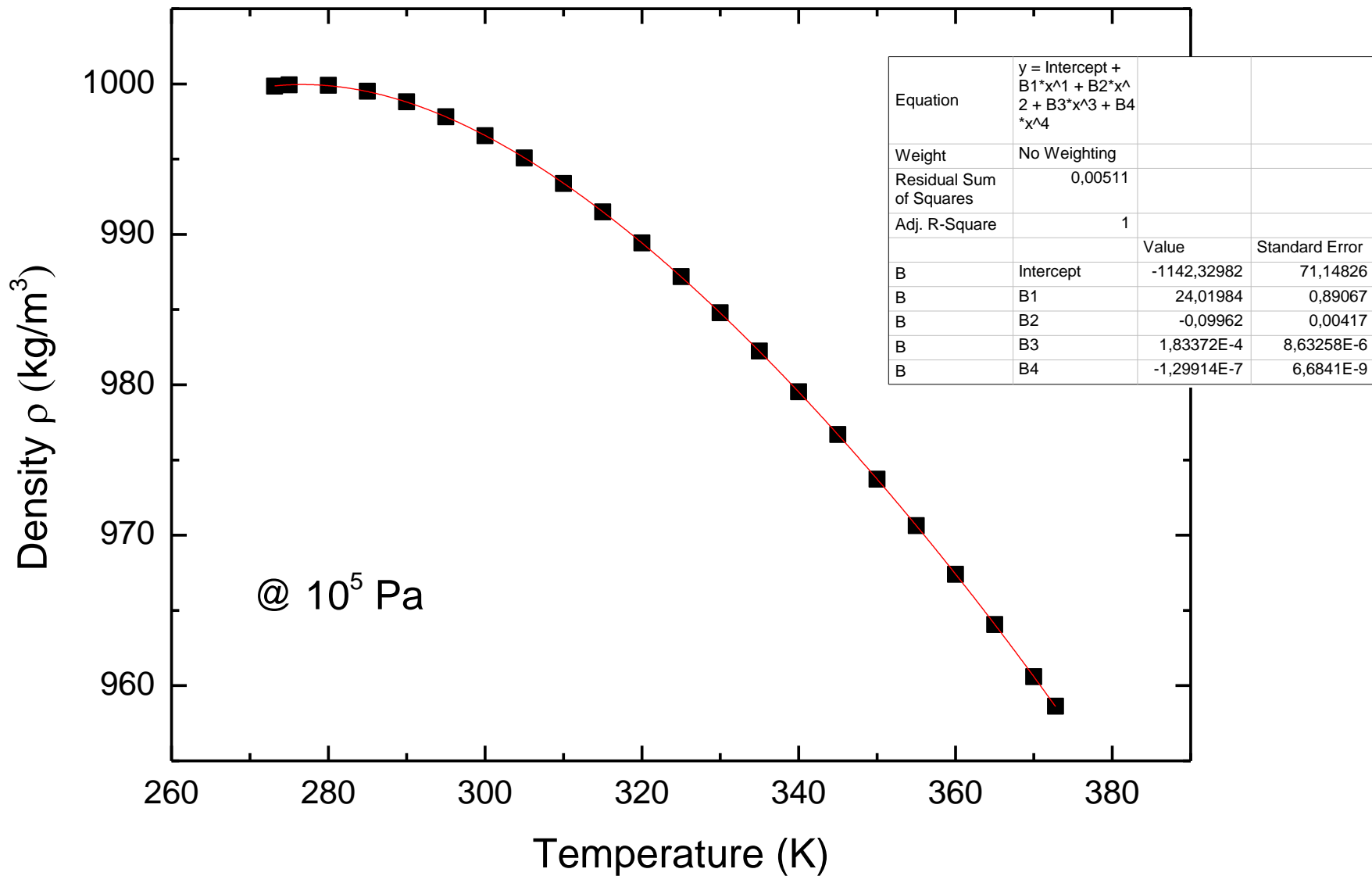
Heat capacity at constant volume C_v



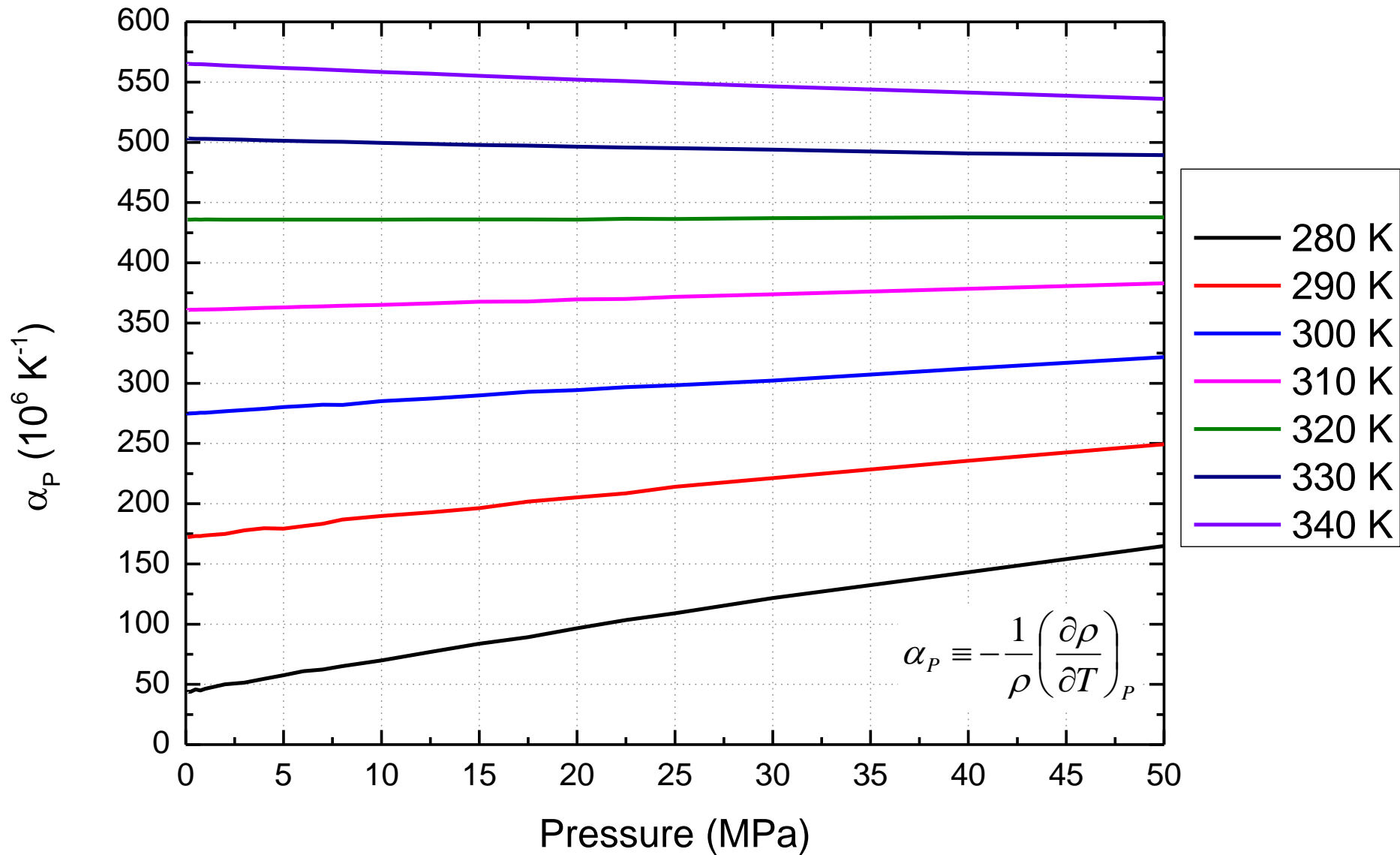
Heat capacity at constant pressure C_p



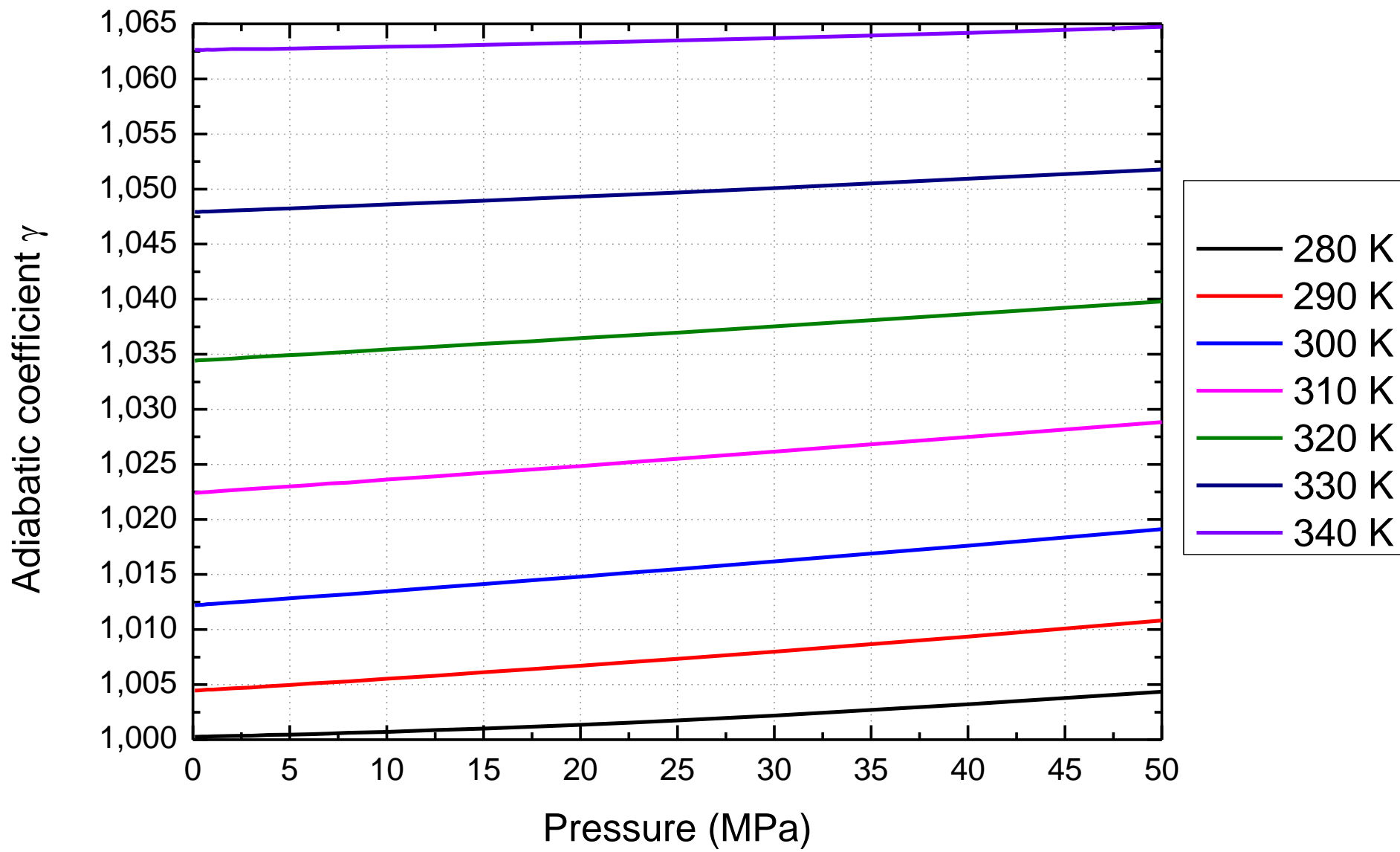
Polynomial representation of density at P_{atm} (ORIGIN software)



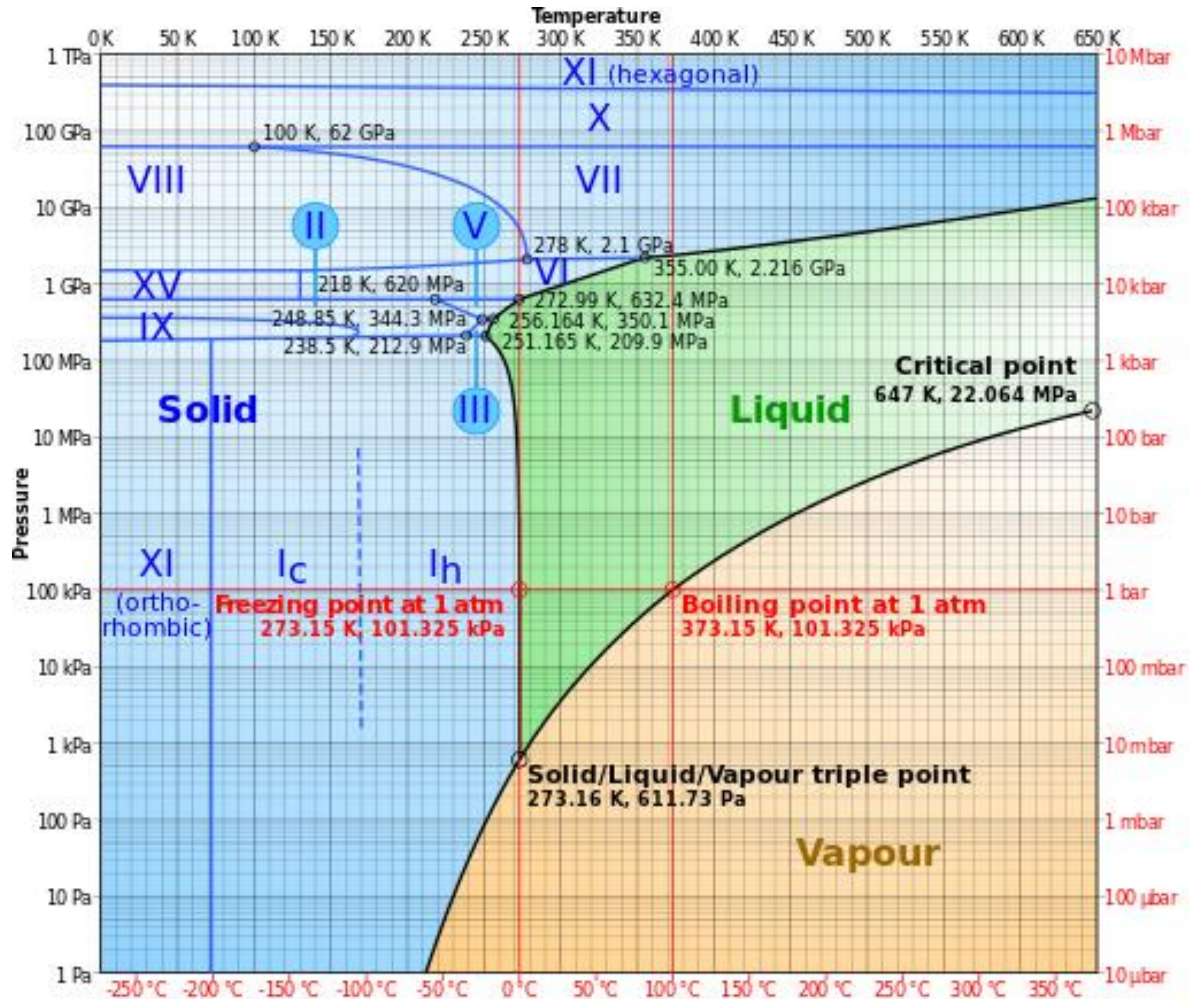
Thermal expansion coefficient α_p (calculation)



Adiabatic coefficient γ $\gamma \equiv \frac{C_P}{C_V}$

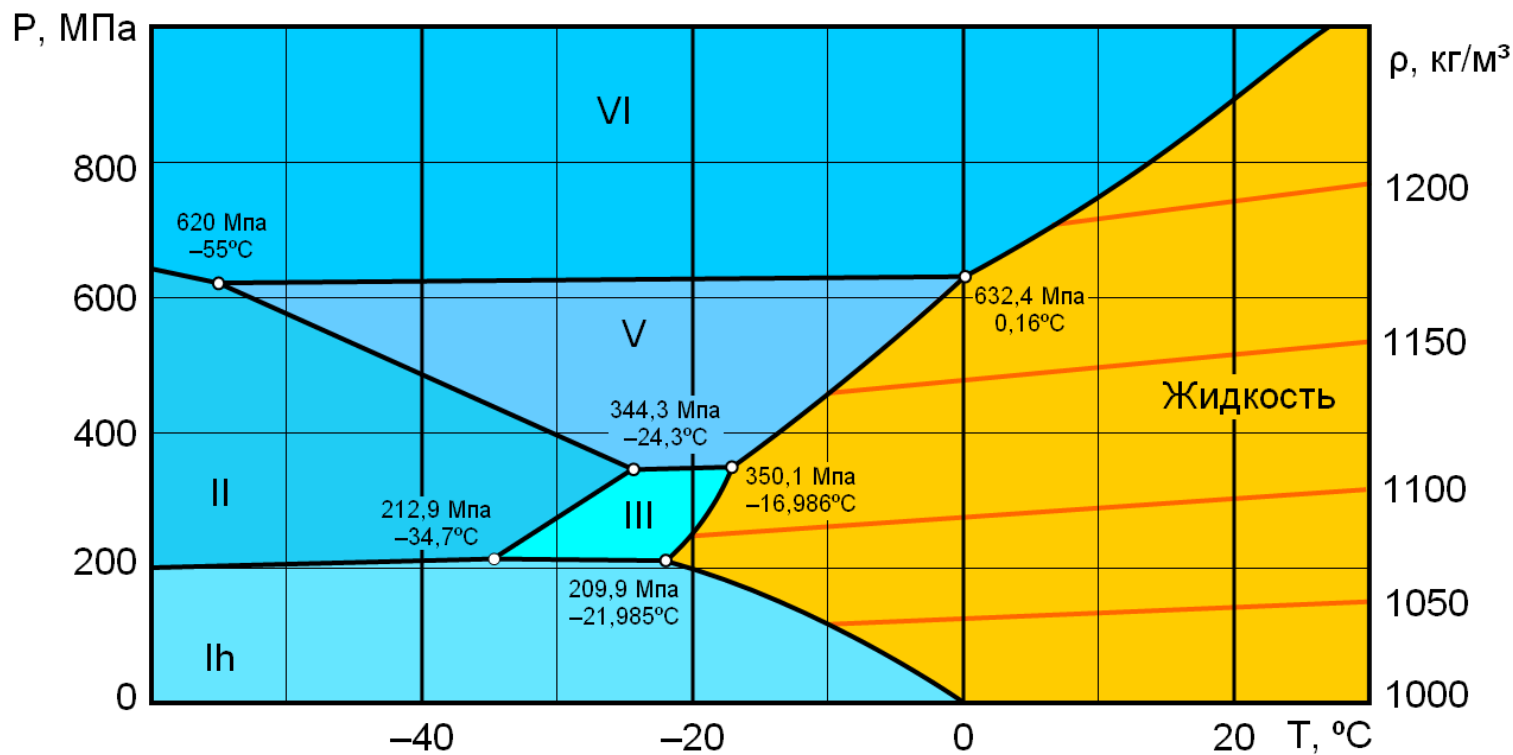


Phase diagram 1/3



<http://en.wikipedia.org/wiki/Ice>

Phase diagram 2/3



http://commons.wikimedia.org/wiki/File:Water_phase_diagram_2.gif

Phase diagram 3/3

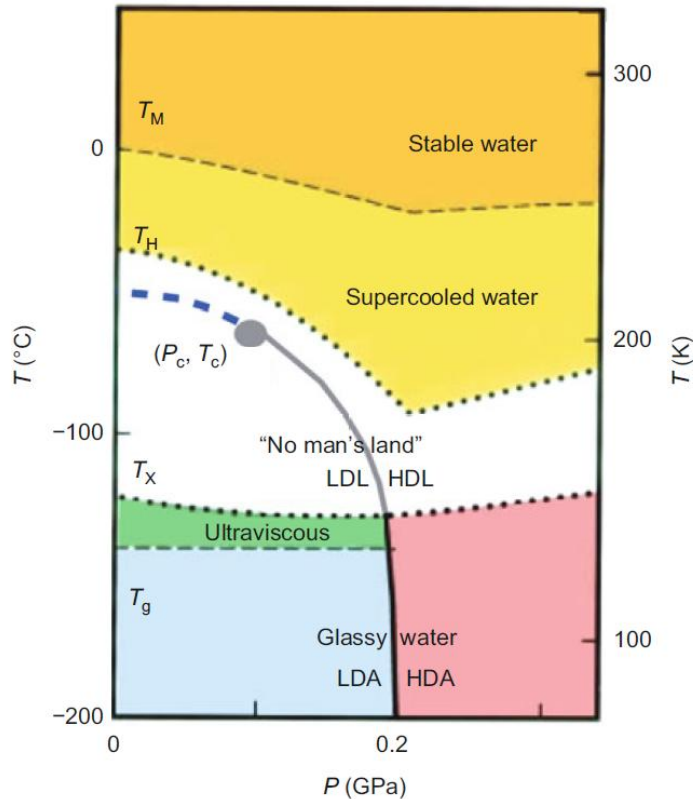


Figure 2 The phase diagram of water (adapted from ref. [25]). A first order LLPT line is shown between HDL and LDL. The LLPT ends with a LLCPP at P_c, T_c . T_m , T_g and T_H represent the melting temperature, glass transition temperature, and homogeneous nucleation temperature, respectively.

SCIENCE CHINA

Physics, Mechanics &
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**Liquid-liquid phase
transition in water**

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5451-z

Mishima O, Stanley H E. Decompression-induced melting of ice IV
and the liquid-liquid transition in water. *Nature*, 1998, 392: 164–168

Bibliography

- *The IAPWS Formulation 1995 for the Thermodynamic Properties of Ordinary Water Substance for General and Scientific Use*, Wagner, W. and Pruß, A., *Journal of Physical and Chemical Reference Data*, **31**, 387-535 (2002), DOI: <http://dx.doi.org/10.1063/1.1461829>
- Explanation of the Density Anomalies of Water (D1-D22) (Martin Chaplin) <http://www1.lsbu.ac.uk/water/explan2.html>