Equation	$\boldsymbol{E(\nu^*)}$	$\boldsymbol{K(\nu=1)}$	$\boldsymbol{K'(\nu=1)}$	**Ref**
Birch (Euler)	$E = E_o^{**} + BV_o\Big(\big(\nu^{-\frac{2}{3}}-1\big)^2 + \frac{C}{2}\big(\nu^{-\frac{2}{3}}-1\big)^3\Big)$	$\frac{8B}{9}$	$C+4$	[1]
Birch (Lagrange)	$E = E_o + BV_oC - BV_o\nu^{\frac{2}{3}}\Big(\big(C-2\big)\big(1-\nu^{\frac{2}{3}}\big)^2 + C\big(1-\nu^{\frac{2}{3}}\big) + C\Big)$	$\frac{16B}{9}$	$C-2$	[1]
Mie-Gruneisen	$E = E_o + \frac{BV_o}{C} - \frac{BV_o}{C-1}\Big(\nu^{-\frac{1}{3}} - \frac{1}{C}\nu^{-\frac{C}{3}}\Big)$	$\frac{B}{9}$	$\frac{7+C}{3}$	[6]
Murnaghan	$E = E_o + \frac{BV_o}{(C+1)}\Big(\frac{\nu^{-C}-1}{C} + \nu - 1\Big)$	B	$C+1$	[3]
Pack-Evans-James	$E = E_o + \frac{BV_o}{C}\Big(\frac{1}{C}\big(e^{3C(1-\nu^{\frac{1}{3}})}-1\big) - 3\big(1-\nu^{\frac{1}{3}}\big)\Big)$	B	$C+1$	[4]
Poirier-Tarantola	$E = E_o + BV_o\Big(ln(\nu)\Big)^2\Big(3 - C\big(ln(\nu)\big)\Big)$	$6B$	$C+2$	[5]
Tait	$E = E_o + \frac{BV_o}{C}\Big(\nu - 1 + \frac{1}{C}\big(e^{C(1-\nu)}-1\big)\Big)$	B	$C-1$	[2]
Vinet	$E = E_o + \frac{BV_o}{C^2}\Big(1 - \big(1 + C(\nu^{\frac{1}{3}}-1)\big)e^{-C(\nu^{\frac{1}{3}}-1)}\Big)$	$\frac{B}{9}$	$\frac{2}{3}C+1$	[7]

Table 1: Theoretical isothermal EOS investigated in this study.
* $\nu = \frac{V}{V_o}$, where V_o is the volume at zero pressure.
** $E_o = E(\nu = 1)$

References

[1] Francis Birch. Finite elastic strain of cubic crystals. *Physical Review*, 71(11):809–824, 1947.

[2] J. H. Dymond and R. Malhotra. The Tait equation: 100 years on. *International Journal of Thermophysics*, 9(6):941–951, 1988.

[3] F D Murnaghan. The compressibility of media under extreme pressures. *Proceedings of the National Academy of Sciences*, 30:244–247, 1944.

[4] D.C. Pack, W.M. Evans, and H.J. James. The Propagation of Shock Waves in Steel and Lead. *The Proceedings of the Physical Society*, 60:1–8, 1948.

[5] J. P. Poirier and A. Tarantola. A logarithmic equation of state. *Physics of the Earth and Planetary Interiors*, 109(1-2):1–8, 1998.

[6] Papiya Bose Roy and Sushil Bose Roy. Applicability of isothermal three-parameter equations of state of solids?a reappraisal. *Journal of Physics: Condensed Matter*, 17(39):6193–6216, 2005.

[7] Pascal Vinet, John Ferrante, James H. Rose, and John R. Smith. Compressibility of solids. *Journal of Geophysical Research*, 92:9319–9325, 1987.