SACADA Database Code: 241

Topology: 3^5T5

# of independent nodes (IN): 5
Transitivity: [5775]
Space Group: Pm-3m
Pearson: cP152
Coordination Number (CN): 3

Year: 2010

Data

Name	Pressure, GPa	Density, g/cm³	Gap, eV	Relative energy, eV/atom	Bulk, GPa	Shear, GPa	Vickers, GPa	Refs
3^5T5 (SACADA #241)		1.203		0.906	108.7	42.5	6.2	SACADA[1]
c152								doi: 10.1088/0953-8984/22/33/334220
schwarzides C152								doi: 10.3103/s1063457610020012
6-1-2-P		1.23	Metal					doi: 10.1016/j.carbon.2014.04.077

Elasticity tensor (kBar)[1]

1535.6848	862.2068	862.2068	0.0000	-0.0000	-0.0000
862.2068	1535.6848	862.2068	0.0000	-0.0000	-0.0000
862.2068	862.2068	1535.6848	-0.0000	-0.0000	0.0000
0.0000	0.0000	-0.0000	496.2094	0.0000	-0.0000
-0.0000	-0.0000	-0.0000	0.0000	496.2094	0.0000
0.0000	-0.0000	0.0000	-0.0000	0.0000	496.2094

[1] We apply the density functional theory (DFT) approach by using the Vienna Ab Initio Simulation Package (VASP) to calculate the total energy and properties of carbon allotropes.

DFT calculations

We apply the density functional theory (DFT) approach by using the Vienna Ab Initio Simulation Package (VASP) package [6] to calculate the total energy of carbon allotropes. The Generalized Gradient Approximation [7] (GGA) for exchange-correlational functional is used everywhere. The energy cutoff set to 600 eV. Fully automatic Γ-centered k-points mesh with a reciprocal-space resolution of $2\pi \times 0.025$ Å^{-1} is applied. We used tetrahedron method with Blöchl corrections to perform the k-point integration. The convergence thresholds are set at 10^{-6} eV for energy and 10^{-5} eV Å^{-1} for ionic forces. Polycrystalline elastic moduli — the bulk modulus, the shear modulus, Young's modulus, and the Poisson's ratio ν — have been calculated within the Voigt–Reuss–Hill [8] approximation. The Vicker's hardness H_v has been estimated according to Oganov's model [9].