

SACADA Database Code: 179

Topology: [NSI](#) 

of independent nodes (IN): 3
Transitivity: [3652]
Space Group: C2/m
Pearson: mS12
Coordination Number (CN): 4

Year: 2013

Data

Name	Pressure, GPa	Density, g/cm ³	Gap, eV	Relative energy, eV/atom	Bulk, GPa	Shear, GPa	Vickers, GPa	Refs
NSI (SACADA #179)		3.293		0.782	397.9	420.8	77.5	SACADA ¹
6B								doi: 10.1103/PhysRevB.88.014102 

Elasticity tensor (kBar)¹

11680.5352	586.4322	874.3964	0.0000	-0.0000	-395.3766
586.4322	10817.2330	765.6018	-0.0000	0.0000	-235.5830
874.3964	765.6018	9024.1428	-0.0000	0.0000	-448.2600
0.0000	-0.0000	-0.0000	4726.8223	-665.8222	0.0000
-0.0000	0.0000	0.0000	-665.8222	3815.6372	-0.0000
-395.3766	-235.5830	-448.2600	0.0000	-0.0000	3113.8070

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 $2\pi \times 0.025 \text{ \AA}^{-1}$ 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 $\text{\AA}^{-1}$ 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].