

Supplementary Materials for

Intrinsic auxeticity and mechanical anisotropy of Si₉C₁₅ siligraphene

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Tab. S1. Elastic constants of nonplanar and planar Si₉C₁₅ siligraphene

	C_{11} (GPa)	C_{22} (GPa)	C_{12} (GPa)	C_{66} (GPa)
Nonplanar	275.43	264.66	-160.24	141.14
Planar	488.42	488.28	151.00	167.46

Tab. S2. A comparison among negative Poisson's ratios of the present Si₉C₁₅ siligraphene and some other 2D materials. Here, results of defective graphene, graphene oxide and hydrogenated graphene listed here are the most negative values.

Material	Poisson's ratio
Pristine graphene ^a	-0.07
Defective graphene ^b	-0.3
Graphene oxide ^c	-0.567
Hydrogenated graphene ^d	-0.04
Monolayer Si ₉ C ₁₅ (present)	-0.12~-0.38

^aRef. [S1]; ^bRef. [S2]; ^cRef. [S3]; ^dRef. [S4].

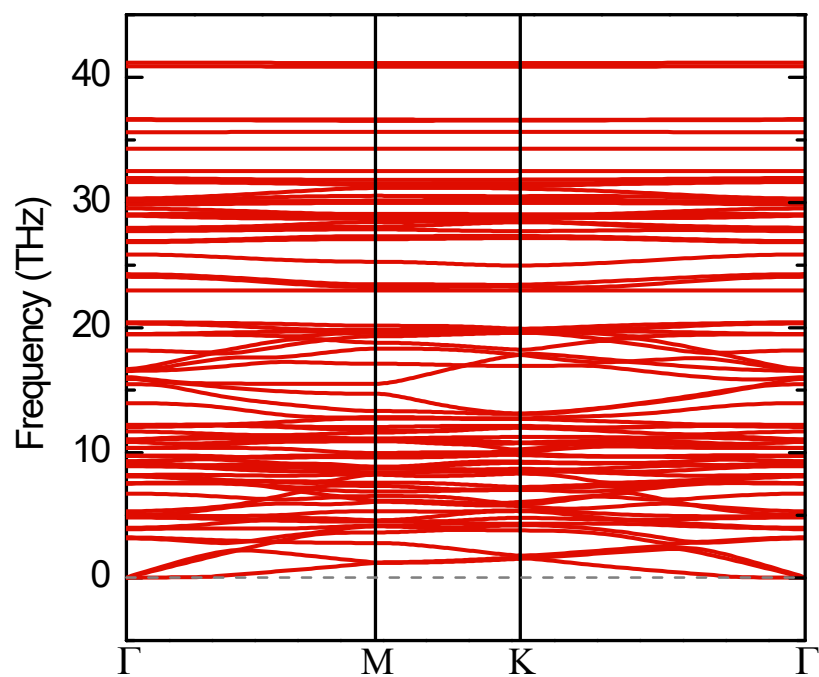


Fig. S1. Phonon dispersion of monolayer Si₉C₁₅.

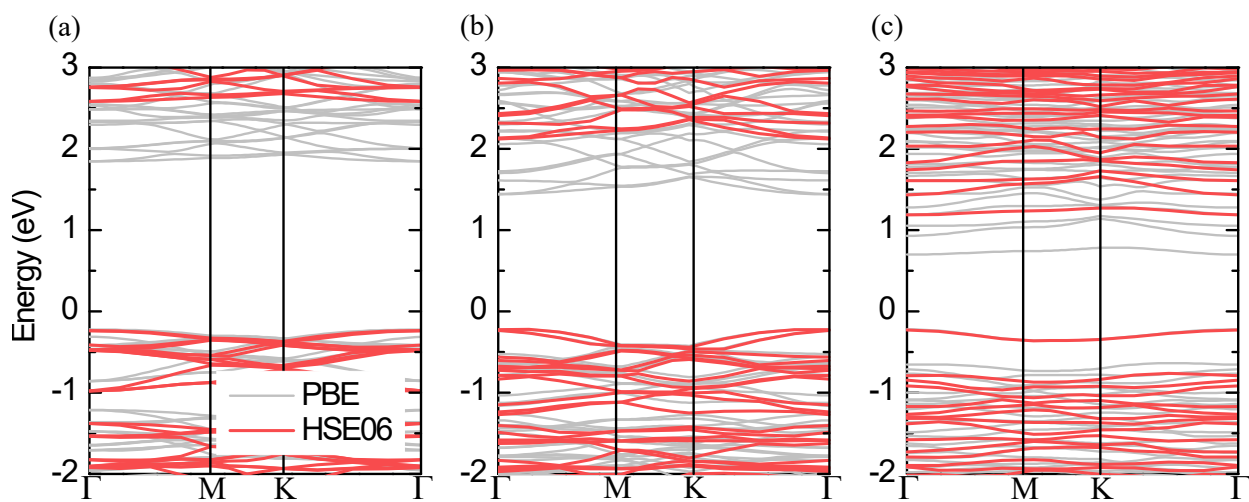


Fig. S2. Band structures of monolayer Si₉C₁₅ (a) without strain and with strains of (b) 5% and (c) 10% in the y (or AC) direction.

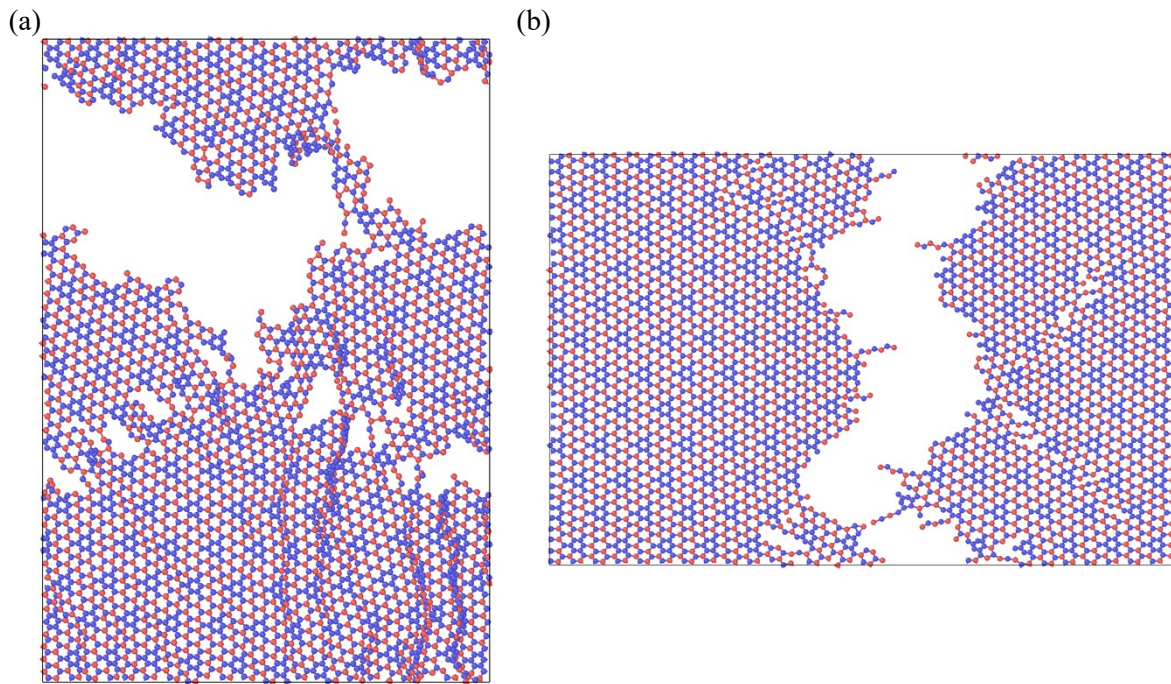


Fig. S3. The fractured structures of Si_9C_{15} siligraphene stretched in (a) x and (b) y directions.

References

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- [S3] J. Wan, J.-W. Jiang, H. S. Park, Negative Poisson's ratio in graphene oxide, *Nanoscale* 9 (2017) 4007-4012.
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