**Supporting Information**

# Two dimensional monolayer rhombic silicene on diamond (111) surface

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**Fig. S1** (a) AIMD calculations for r-germanene/diamond and r-stanene/diamond of total energy as a function of time, and the superstructures at 500 K. (b) The DOS of r-silicene/diamond, r-germanene/diamond, and r-stanene/diamond (left column), and the DOS of pristine silicene, germanene and stanene hexagonal monolayers (right column).

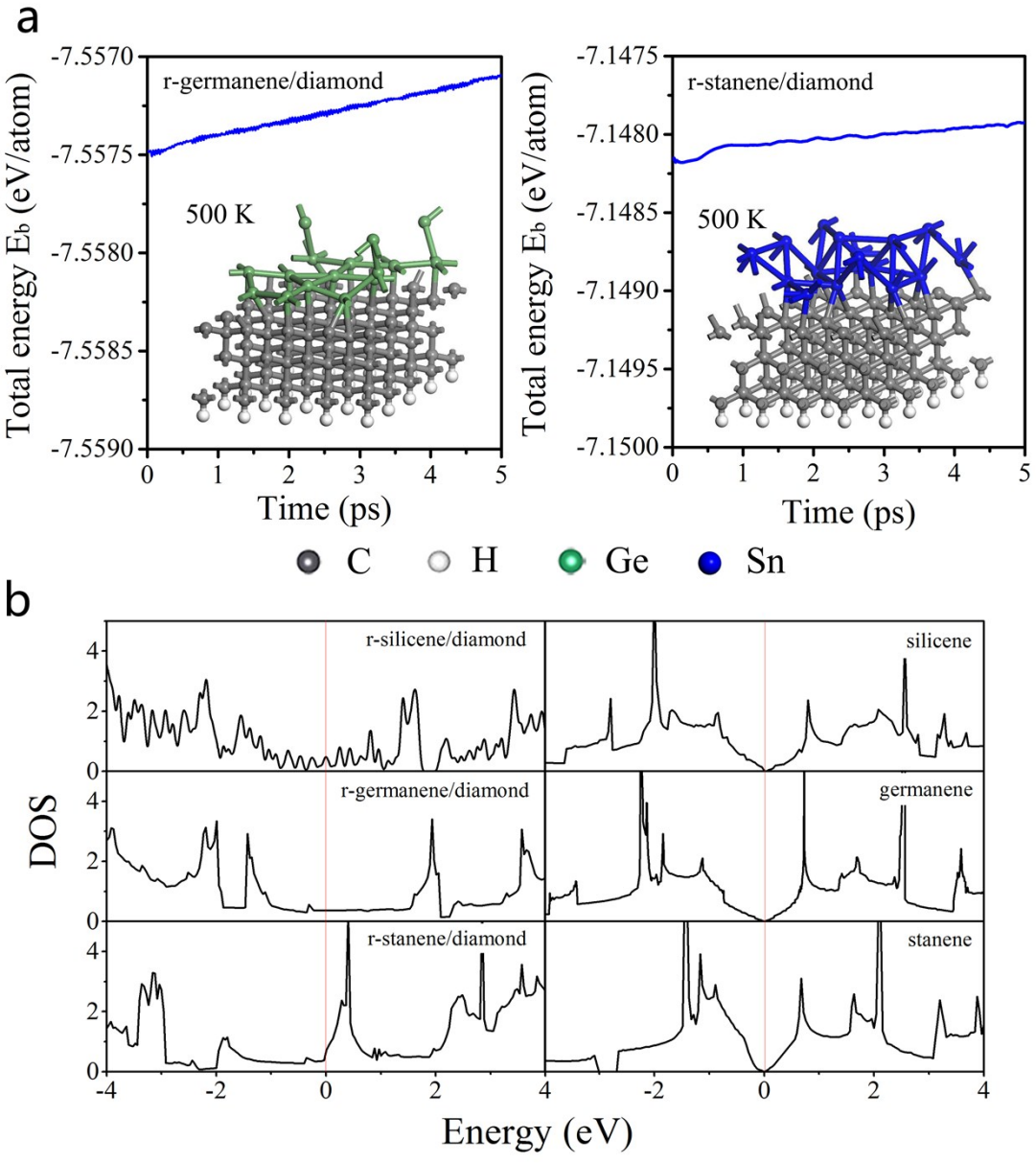

**Table S1** The structural parameters of rhombic Si, Ge and Sn monolayers on diamond (111) surface. $l_{X\text{-}C}$ (Å), $E_b$ (eV) and $l_{X\text{-}X}$ (Å) stand for the X-C bond length, X-C bond energy per X atom and X-X bond length, respectively. X stands for Si, Ge and Sn.

| | r-silicene/diamond | r-germanene/diamond | r-stanene/diamond |
|---|---|---|---|
| $l_{X\text{-}C}$ (Å) | 1.994 | 2.132 | 2.399 |
| $l_{X\text{-}X}$ (Å) | 2.535 | 2.535 | 2.535 |
| $E_b$ (eV) | 2.528 | 1.898 | 1.406 |
| surface symmetry | P6/mmm | P6/mmm | P6/mmm |
| surface tension (N/m) | 0.011 | 3.131 | 12.523 |