Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

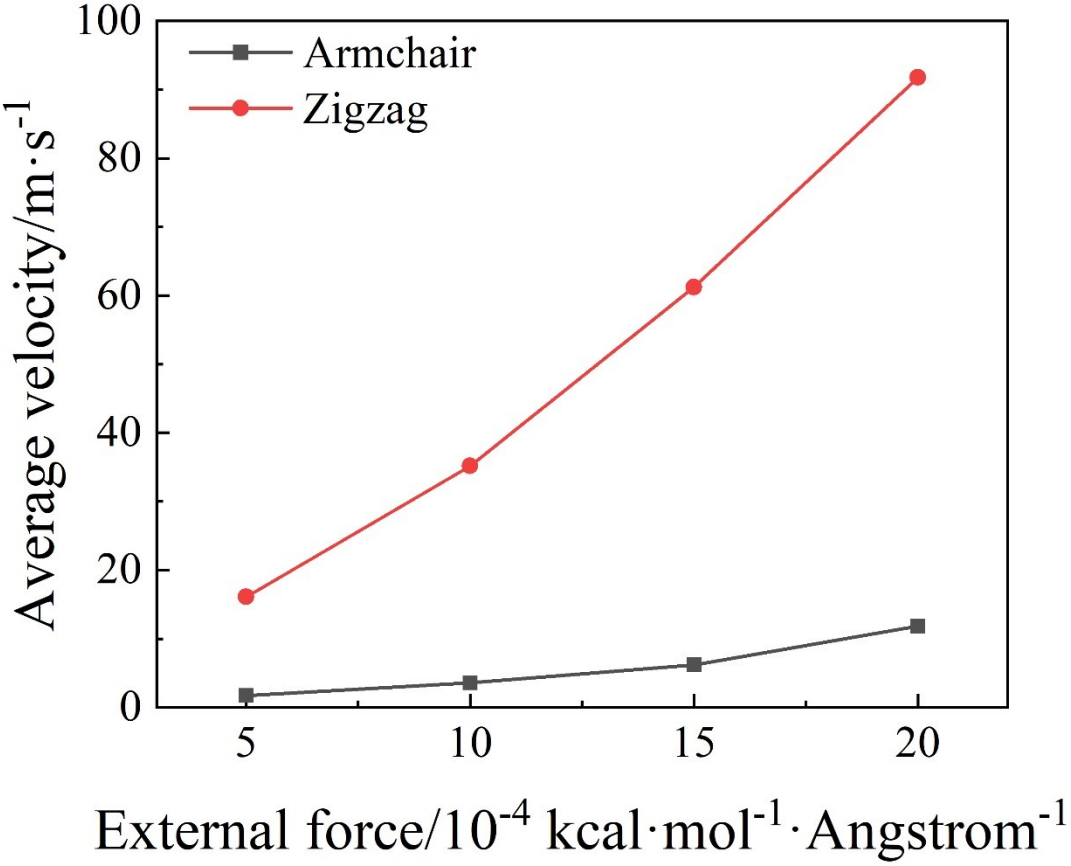

Figure S1. The Average velocity for 2-nm BP nanochannels as the external driving force change from 5×10^{-4} to 2×10^{-3} kcal mol^{-1} $Å^{-1}$.

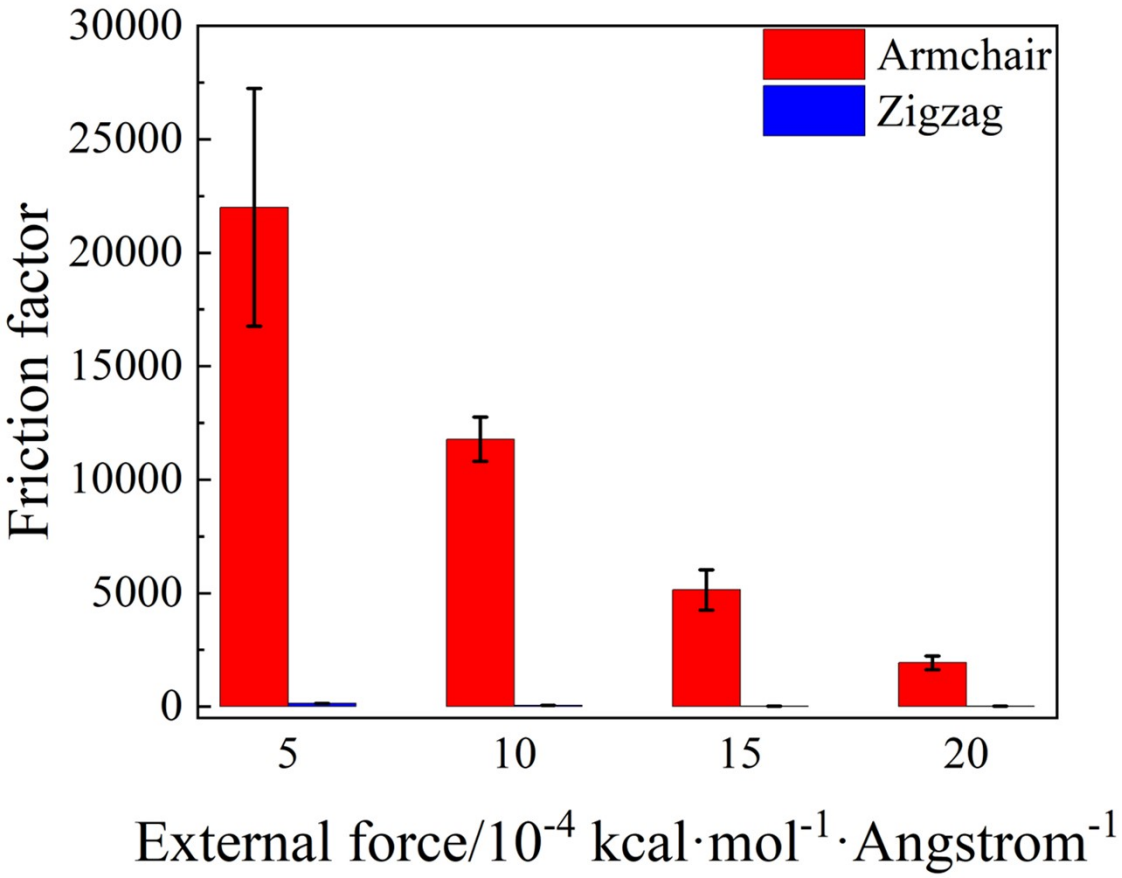

Figure S2. Average friction factor between C_{12} molecules in the layered structure and BP nanochannels under the external driving force change from 5×10^{-4} to 2×10^{-3} kcal mol^{-1} $Å^{-1}$.

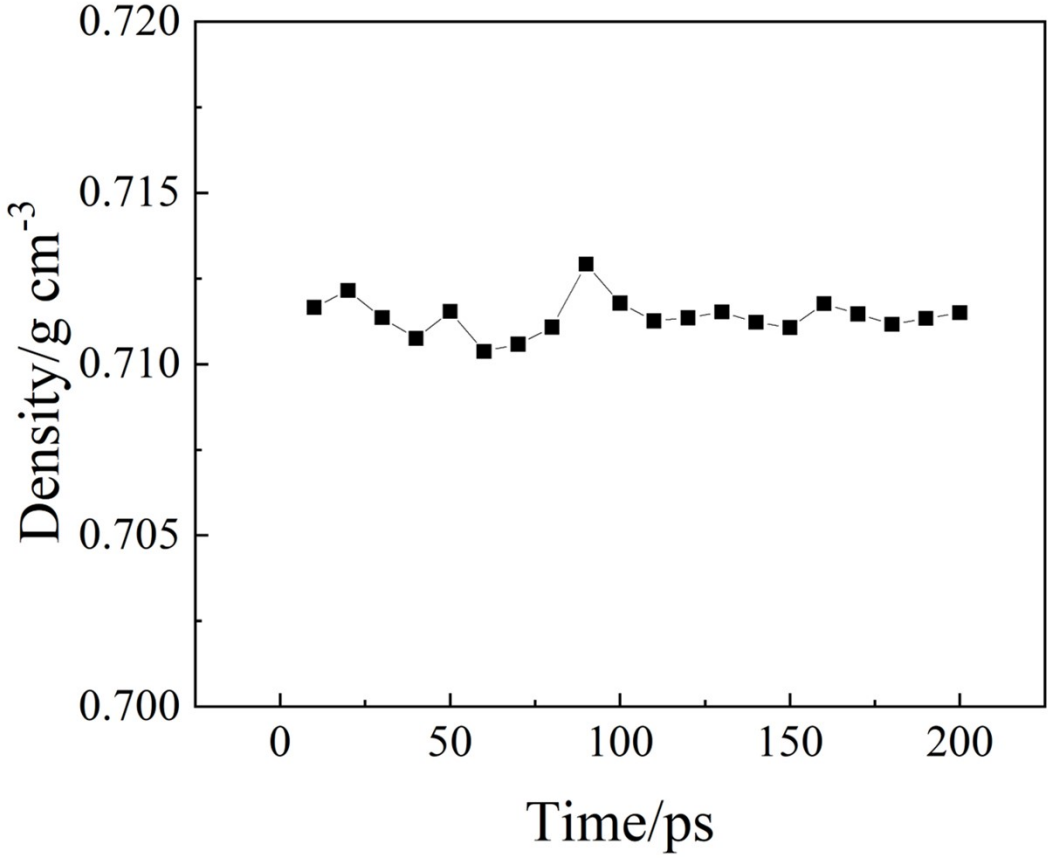

Figure S3. The density of pure C_{12} in the NVT relaxed process.

Table S1. The group forces between the BP nanochannels (armchair and zigzag) and the C12 nanofluid, atomic numbers of C12 in nanochannels with different widths under the external driving force of 1×10-3 kcal mol-1 Å-1, and pressure gradients under different conditions.

Condition	Atoms number	Group force/ kcal mol^{-1} $Å^{-1}$	Pressure gradient/ kcal mol^{-1} $Å^{-4}$
2 nm, armchair	4180	628.565	0.000072
2 nm, zigzag	4180	630.654	0.000072
4 nm, armchair	8360	635.836	0.000081
4 nm, zigzag	8360	638.719	0.000081
6 nm, armchair	12540	625.060	0.000086
6 nm, zigzag	12540	625.510	0.000086

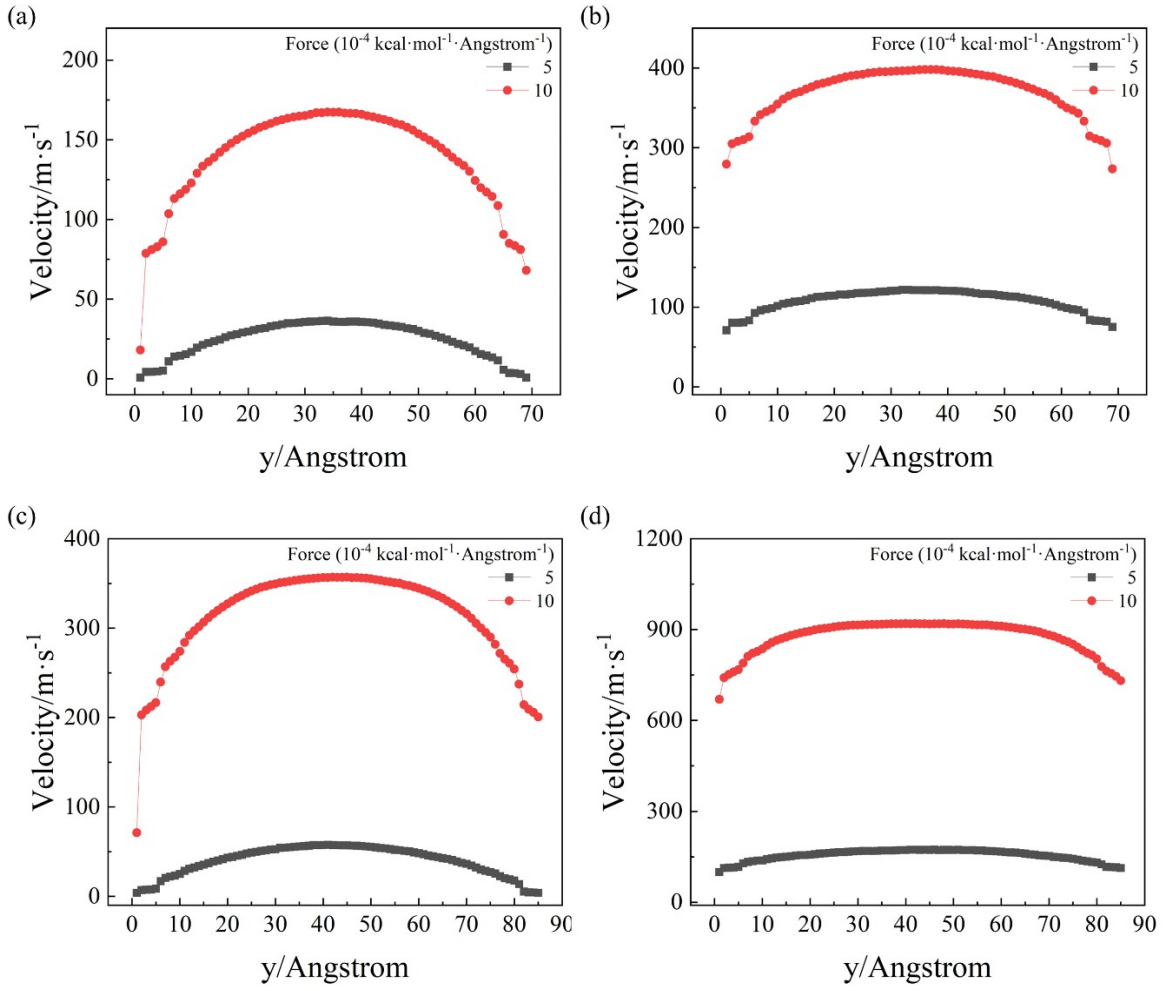

Figure S4. Velocity profiles of the C_{12} molecules confined in 8-nm BP nanochannels when flowing along the (a) armchair direction and (b) zigzag direction. Velocity profiles of the C_{12} molecules confined in 10-nm BP nanochannels when flowing along the (c) armchair direction and (d) zigzag direction.