Supporting Information

Tailoring the Nanostructure of Graphene as an Oil-Based Additive: toward Synergistic Lubrication with an Amorphous Carbon Film

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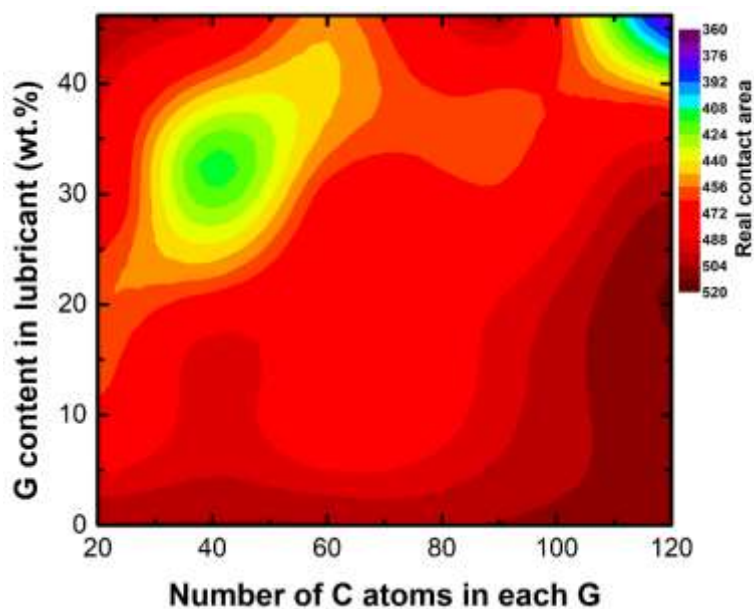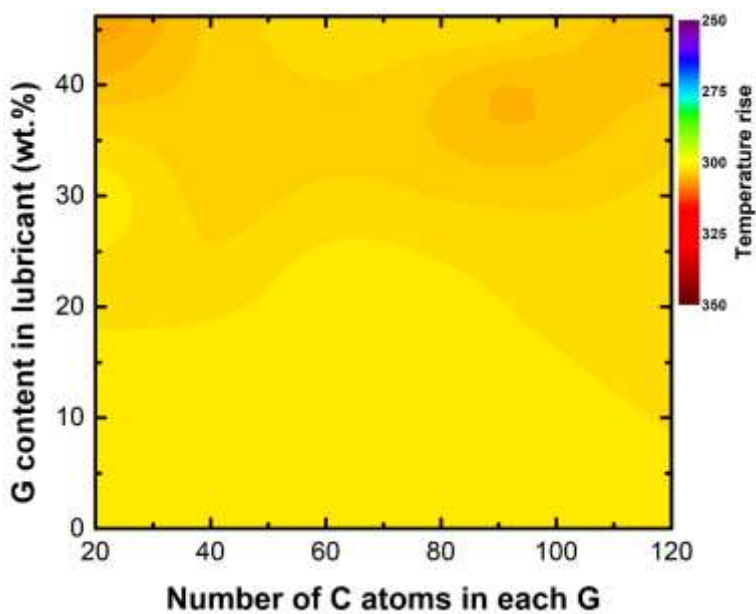　Tel: 82-2-958-5450; Fax: 82-2-958-5451. E-mail: lixw0826@gmail.com

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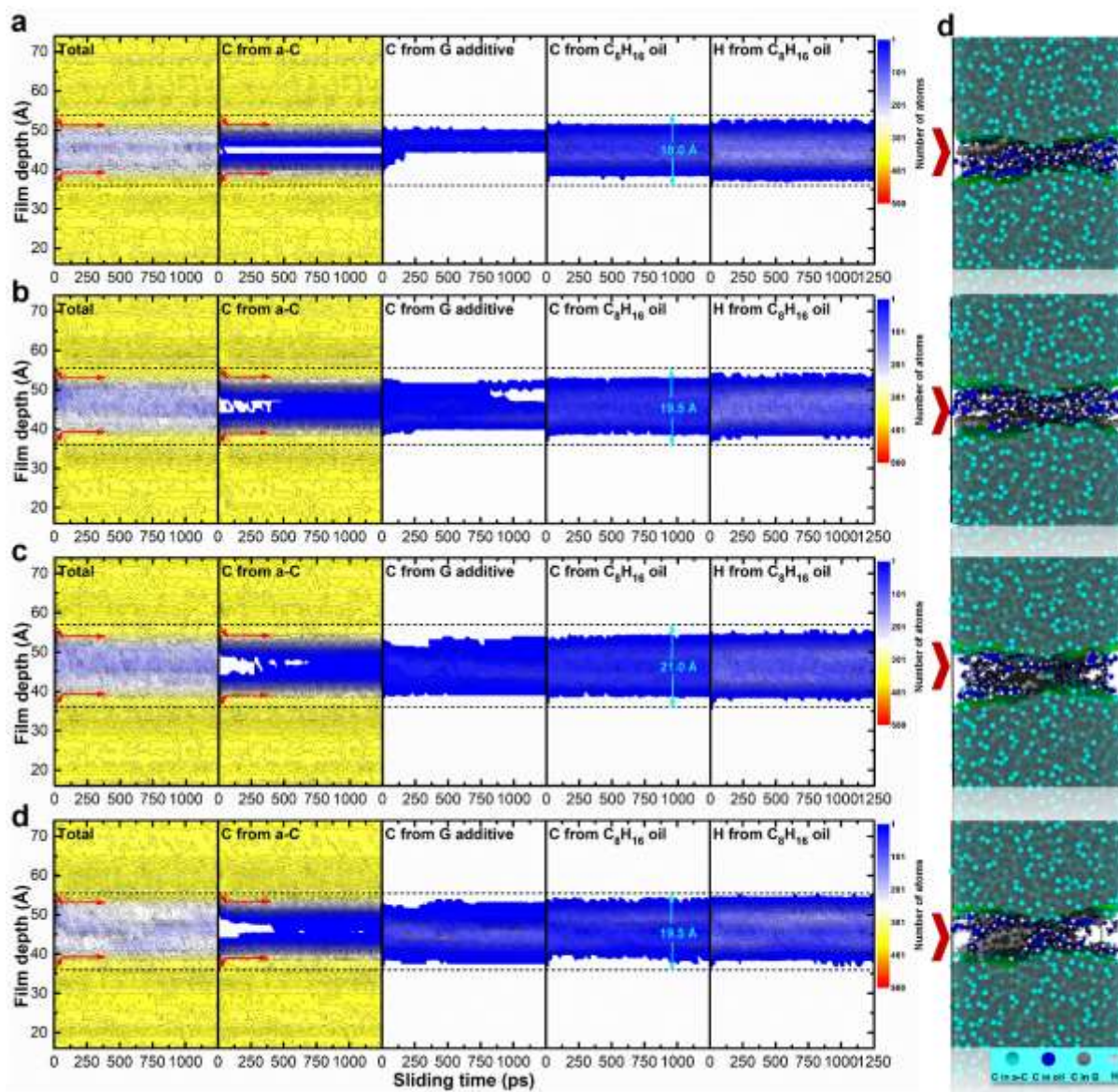
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Figure S1. Changes of real contact area with size and content of G additive (unit: Å^2).


Figure S2. Rise of temperature with size and content of G additive during the sliding process.

Figure S3. Depth profiles of atomic distribution in the system. (a), (b), (c), and (d) are the atomic distributions of C and H atoms versus sliding time in the system with G20 contents of 12.5 wt.%, 22.2 wt.%, 30.0 wt.%, and 46.2 wt.%, respectively. (d) Corresponding morphology at a sliding time of 1250 ps for each case.
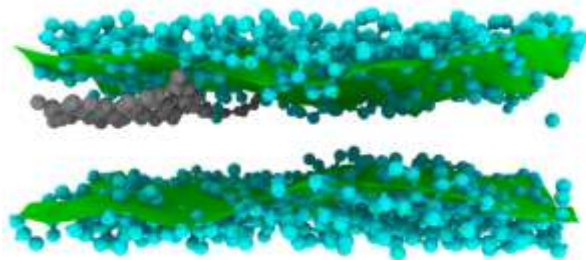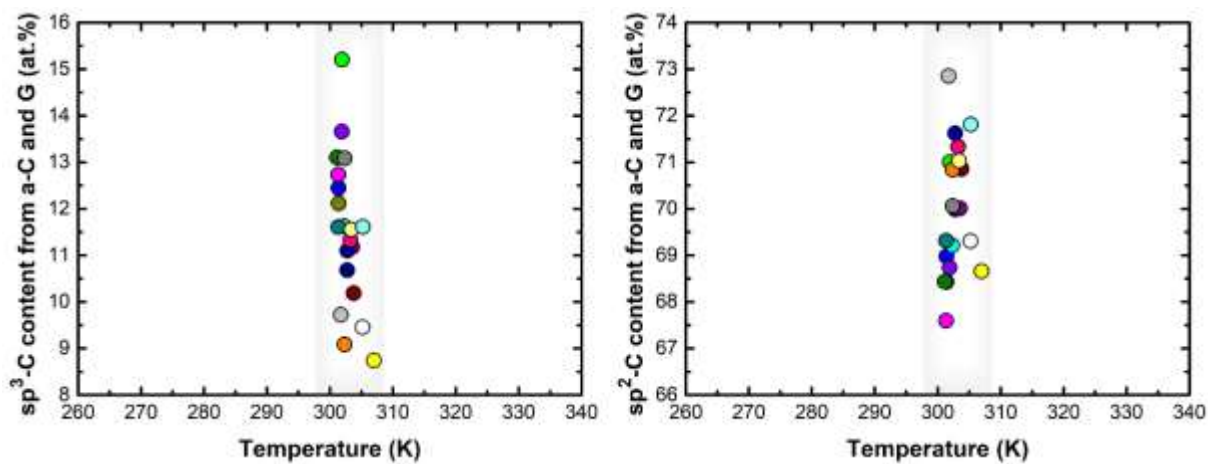
Figure S4. Morphology of friction interface for the a-C@C_8H_{16}+G60-12.5 wt.% system after

sliding time of 1250 ps, in which the base oil molecules are neglected for view.
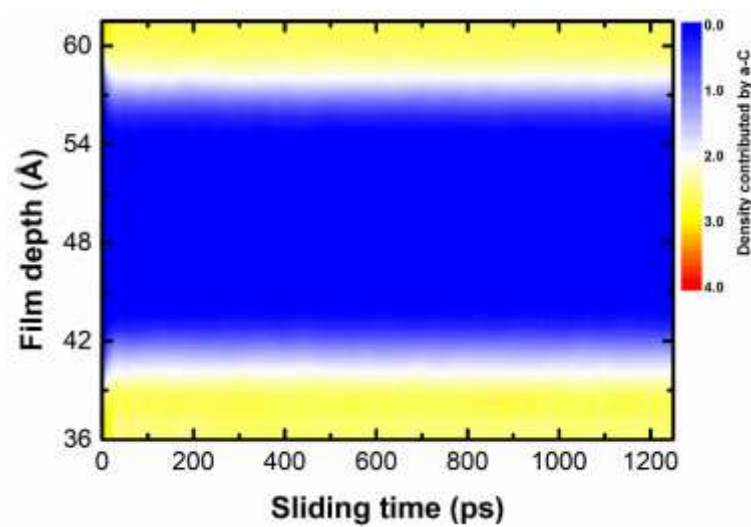
Figure S5. Density of friction interface, which is contributed by a-C, for a-C@C_8H_{16}+G120-22.2 wt.%

system.
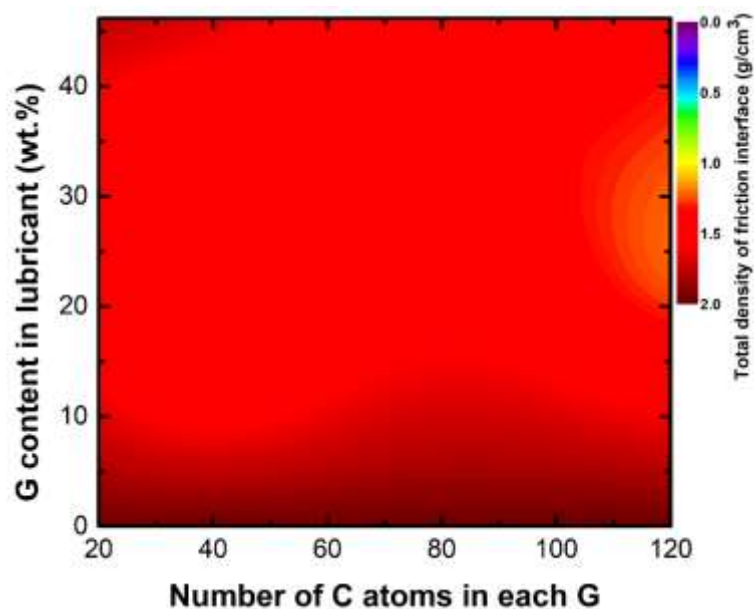
Figure S6. Total density of friction interface with size and content of G additive.

Figure S7. Relationship between the hybridized structure and temperature at the friction interface. Only the contributions of a-C and G to the hybridized structure are considered.