

Electronic Supplementary Material

Graphite-based solid lubricant for high-temperature lubrication

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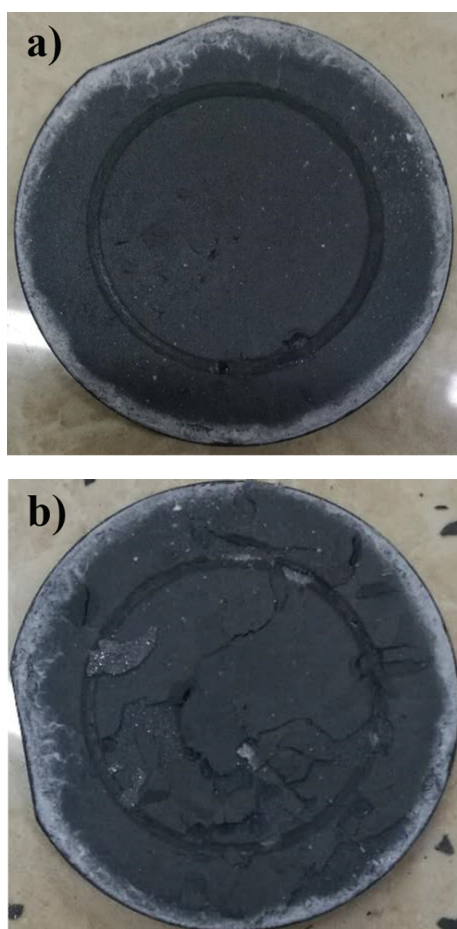


Fig. S1 Images of solid lubricating coating cooling to (a) ~ 200 °C and (b) room temperature after the friction test at 900 °C under the air atmosphere.

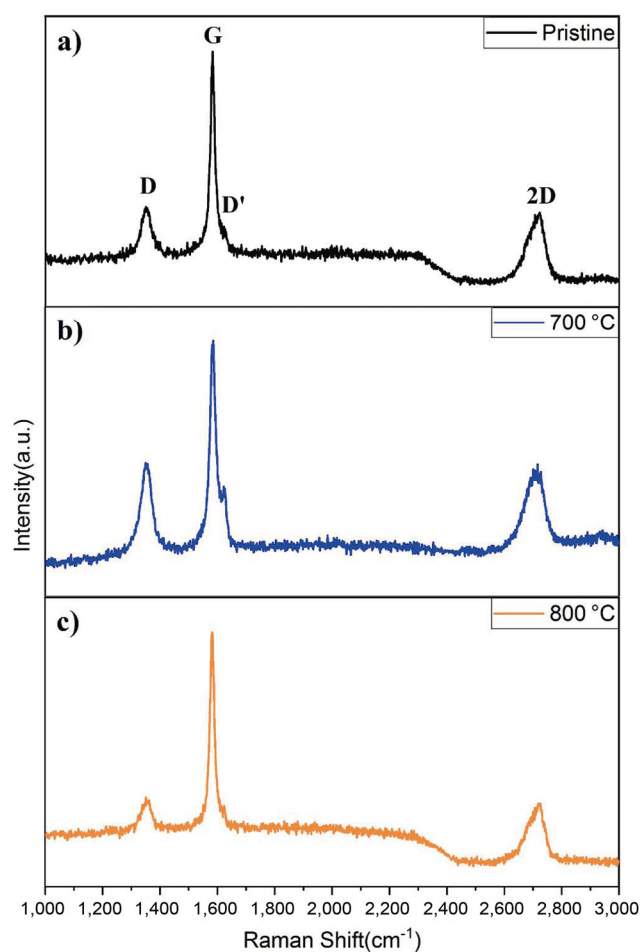


Fig. S2 Micro-Raman spectra of (a) the pristine coating and the wear track of the coating after the friction test at (b) 700 °C and (c) 800 °C.

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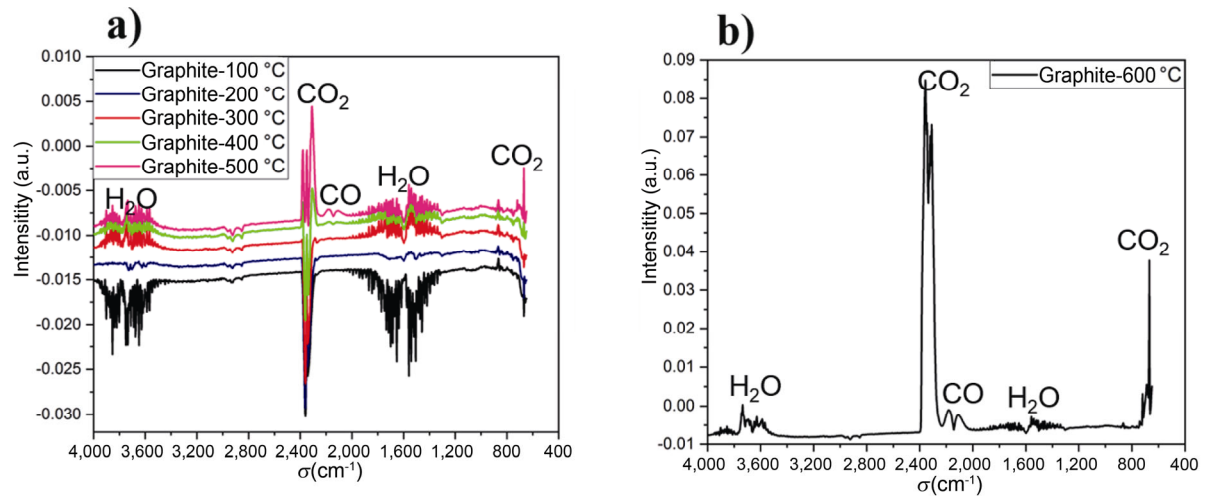


Fig. S3 FTIR spectra, collected *in situ*, of the evolved gases from the pristine graphite (a) within the temperature range of 100–500 °C and (b) at 600 °C. The 600 °C FTIR spectrum was separated for clarity.

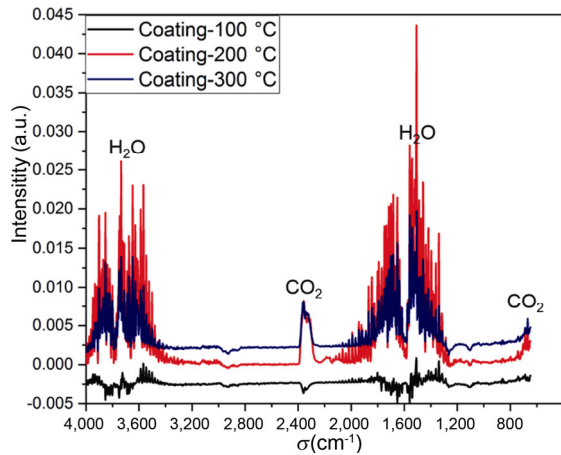


Fig. S4 FTIR spectra, collected *in situ*, of the as-prepared coating in the temperature range of 100–300 °C.

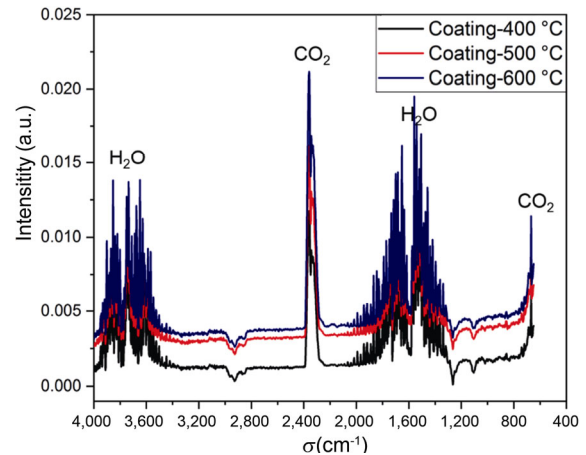


Fig. S5 FTIR spectra, collected *in situ*, of as-prepared coating in the temperature range of 400–600 °C.

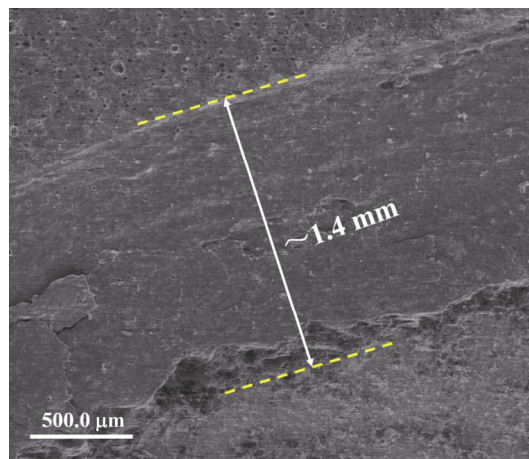


Fig. S6 SEM image of the wear track after the friction test. The wear track was relatively wide with both complete and partial coating.

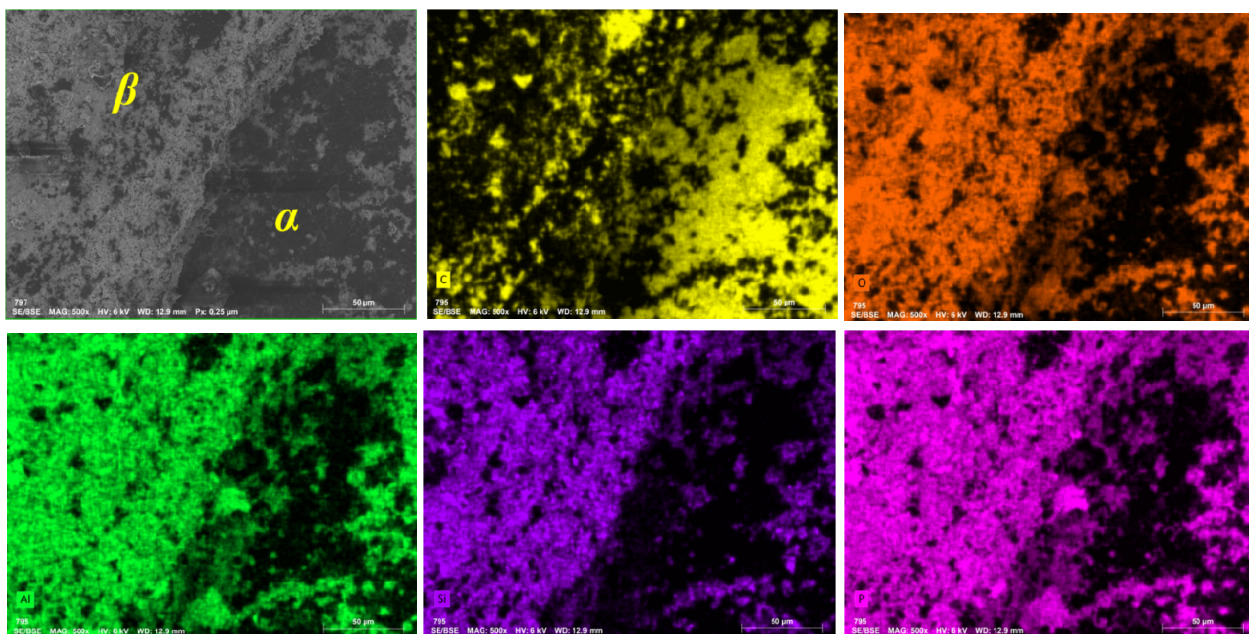


Fig. S7 EDS mapping showing the surface elemental distribution of α and β zones in the lubricating coating after the friction test at 700 °C.

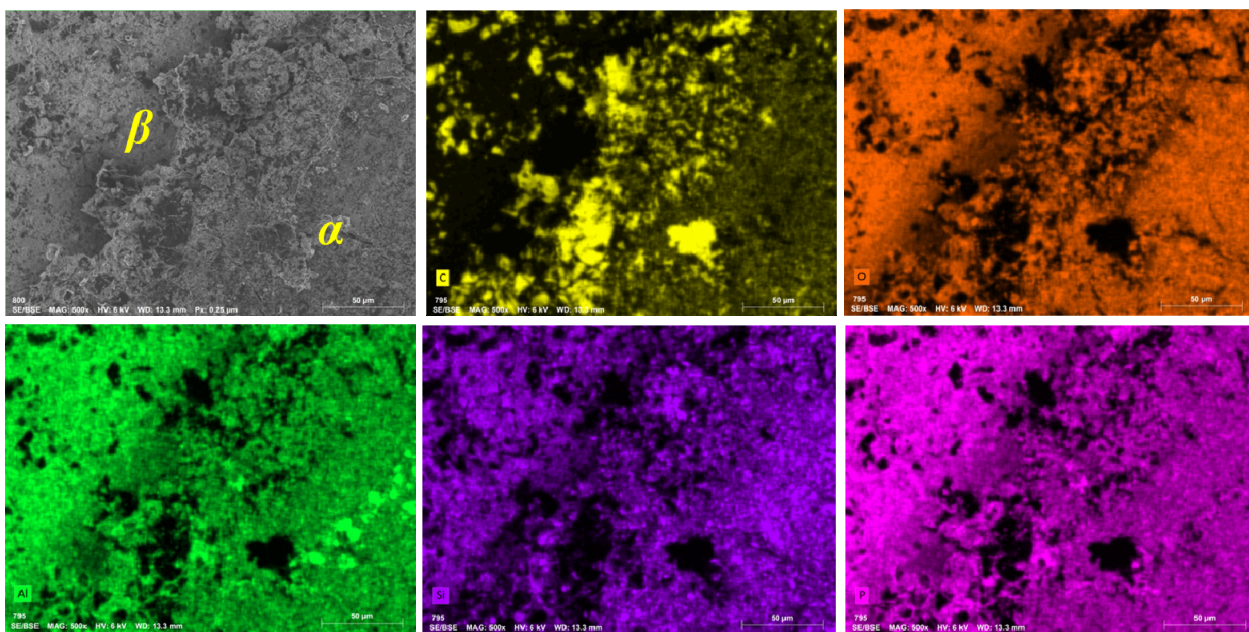


Fig. S8 EDS mapping showing the surface elemental distribution of α and β zones in the lubricating coating after the friction test at 800 °C.