**Supporting Information**

**Convenient Synthesis of Inorganic Fullerene-like WS2 Self-lubricating Films and Their Tribological Behaviors**

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Fig. S1 Flow diagram of the bulk synthesis route of IF-WS2 Nanoparticles.

Fig. S2 (a)Diagram of the terminal face friction and wear tester (MMU-10G) , (b)Photograph of the upper Test piece and (c) Dimension drawing of the friction Pair

which were used in the present work to investigate the tribological properties.

According to formula: P=L/S,where L is the friction load, S is the area of the friction face calculated from Fig. S2 (c). The friction load used in this study can be converted into the pressure value used in common tribological tests. The specific comparison data is shown in Table S1.

Table S1. Comparison table of friction load and pressure conversion

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Load (N) | 150 | 300 | 600 | 1200 | 2200 | 3000 |
| P ( *MPa* ) | 1.1 | 2.2 | 4.4 | 8.8 | 15.9 | 21.7 |

Table S2. Friction coefficients of IF-WS2 and 2H-WS2 films at the rotating speed of 300r/min

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Load (N) | 150 | 300 | 600 | 1200 |
| IF ( *μavg* ) | 0.008 | 0.017 | 0.021 | 0.039 |
| 2H ( *μavg* ) | 0.039 | 0.040 | 0.056 | 0.081 |

Table S3. Friction coefficients of IF-WS2 and 2H-WS2 at the rotating speed of 600 r/min

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Load (N) | 150 | 300 | 600 | 1200 |
| IF(*μavg*) | 0.010 | 0.020 | 0.031 | 0.066 |
| 2H(*μavg*) | 0.042 | 0.053 | 0.087 | 0.127 |