**Supplementary information**

TABLE SI:Theromogravimetric weight loss features for the nanocomposite systems

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Specimen  | T(5%)  | T(10%)  | T(50%) | T(70%)  |
| PVA  | 112 oC  | 245 oC  | 375 oC  | 430 oC  |
| (3wt%) IF-WS2/PVA  | 121 oC  | 304 oC  | 373 oC  | 480 oC  |
| (6wt%) IF-WS2/PVA  | 108 oC  | 280 oC  | 381 oC  | 510 oC  |
| (10 wt%) IF-WS2/PVA | 115 oC  | 288 oC  | 408 oC  | 528 oC  |

TABLE SII: Wetting-dewetting phenomena: Dynamic contact angle (CA) parameters and CA hysteresis witnessed at the nanocomposite film surfaces

|  |  |  |  |
| --- | --- | --- | --- |
| Specimen | Contact angle (°) | CAH (°) | Critical angles, *α*1 (°), *α*2 (°) |
| Advancing | Receding |  |  |
| PVA  | 74  | 38 | 36 | -- |
| (3 wt%) IF-WS2/PVA  | 90  | 56 | 34 | -- |
| (6wt%) IF-WS2/PVA  | 95  | 66 | 29 | 24, 45 |
| (10 wt%) IF-WS2/PVA | 121 | 102 | 19 | 43, 61 |