**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 |