# Supporting Information

# High-hardness, water-stable, and UV-resistant conductive coatings based on waterborne PEDOT:PSS/Epoxy/(KH560/$SiO_2$) composite

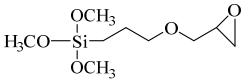
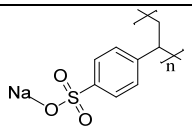
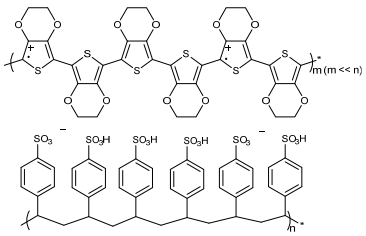
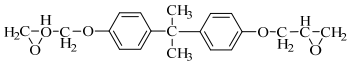
Zhanqi Li [1], Ling Zhu [2], Xiaowen Xie [2], Meng Zhou [2], Changqing Fu [2,*] and Shuai Chen [1,2,*]

[1] *School of Chemistry and Chemical Engineering, Jiangxi Science and Technology Normal University, Nanchang 330013, Jiangxi, China*

[2] *Jiangxi Engineering Laboratory of Waterborne Coatings, Nanchang 330013, Jiangxi, China*

* *Correspondence: shuaichen@jxstnu.edu.cn; fuchq0791@163.com*

**Table S1.** Physical and chemical properties of the utilized materials.

| Materials | Chemical structure | Physical properties | Chemical properties |
|---|---|---|---|
| KH560 |  | Easily absorb moisture | Chemical reactions such as grafting can occur |
| Nano-$SiO_2$ |  | Nano size, easy to aggregate | Grafting reactions can occur |
| PSS-Na |  | Water-soluble | / |
| EDOT |  | Slightly water-soluble | Polymerisation can occur |
| PEDOT:PSS |  | Water dispersable | / |
| WR 2253 |  | Water-soluble and water stable | Cross-linking reactions can occur |
| WRH 6765 | / | Water-soluble and water dispersable | Opens the epoxy ring when utilized as amine curing agent. |

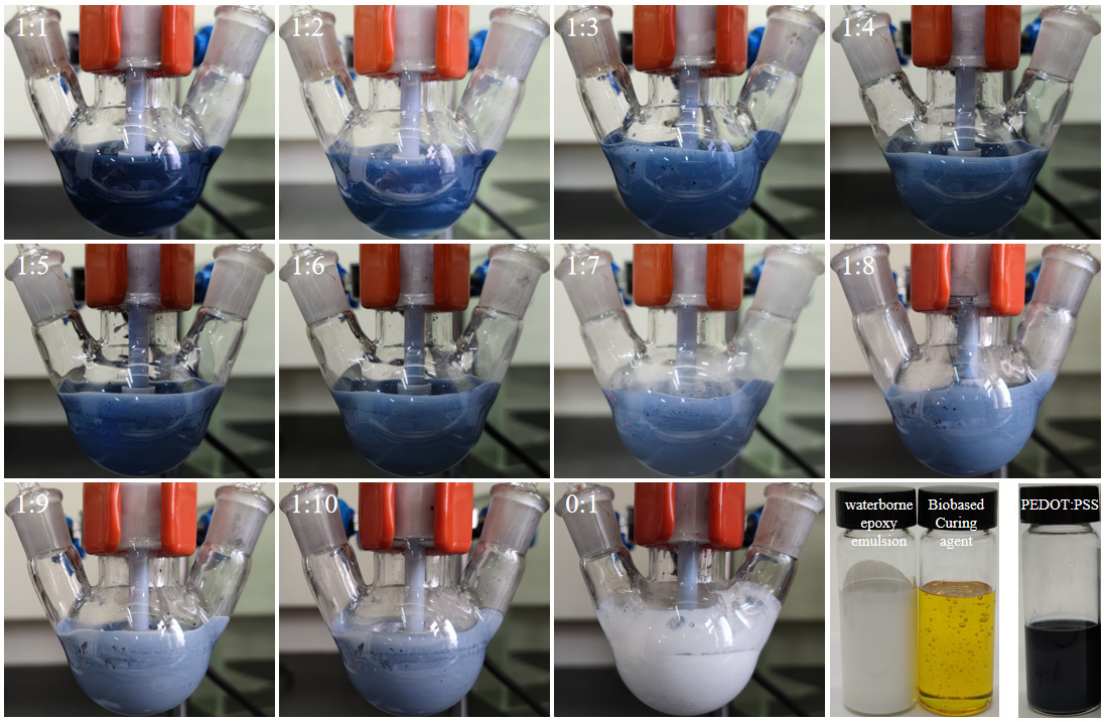



**Figure S1.** Photos of waterborne epoxy emulsion, biobased curing agent, and PEDOT:PSS/Epoxy aqueous dispersions with different P:E ratios.

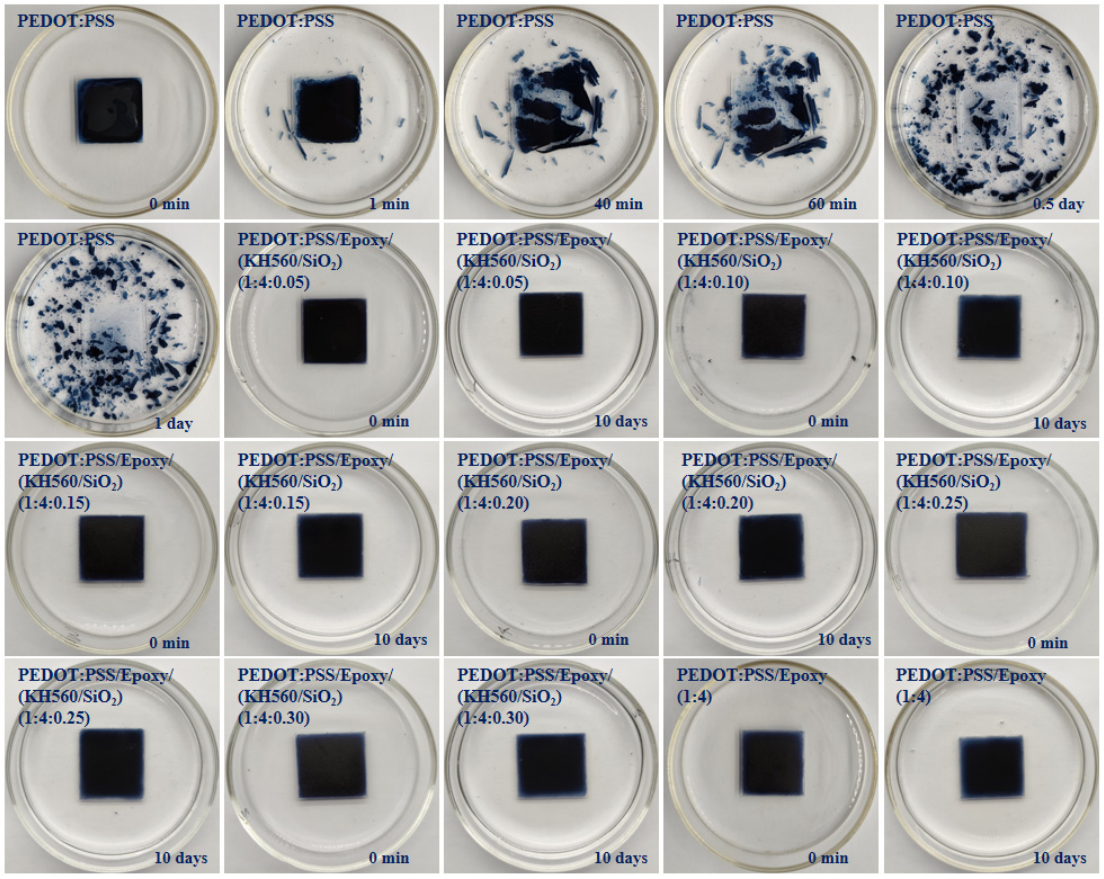



**Figure S2.** Water immersion experiment of PEDOT:PSS (0-1 day),

PEDOT:PSS/Epoxy (P:E= 1:4) (0 day, 10 days), and PEDOT:PSS/Epoxy/(KH560/$SiO_2$) (0 days, 10 days) coatings.

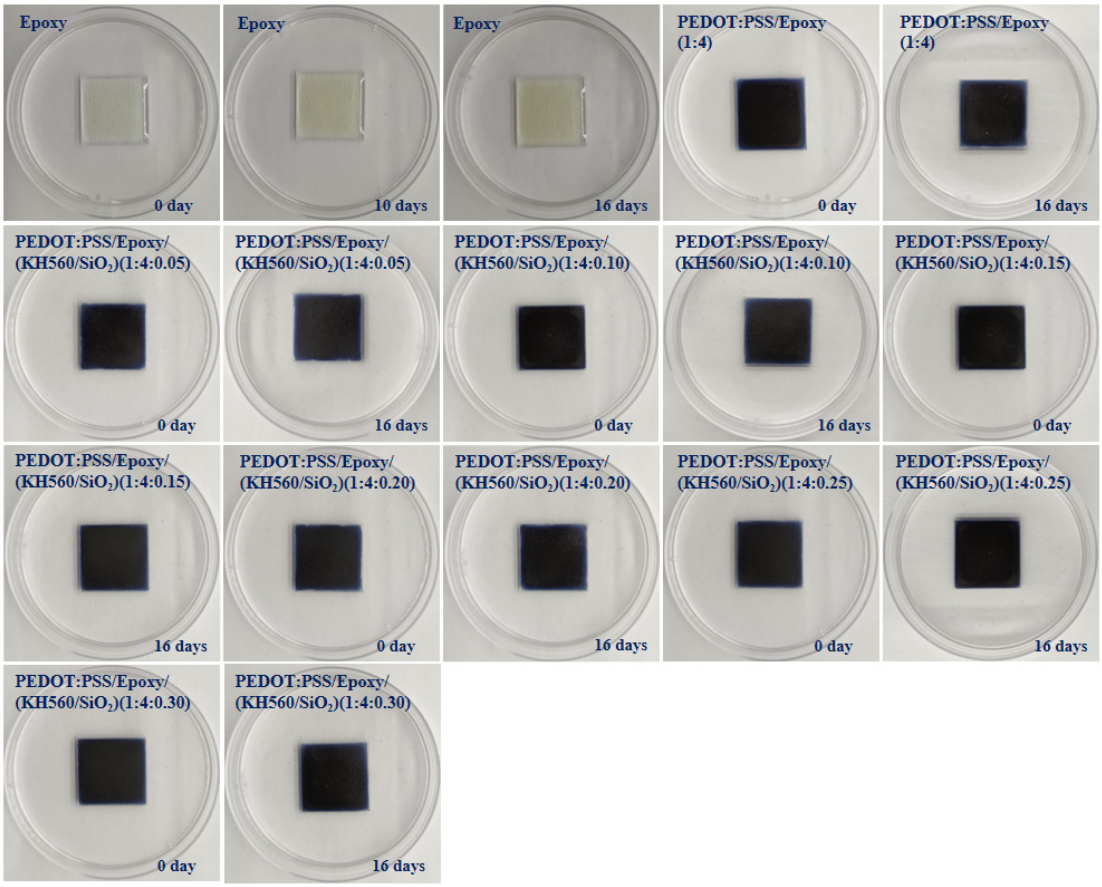



**Figure S3.** UV resistance experiment of Epoxy, PEDOT:PSS/Epoxy (P:E= 1:4), and PEDOT:PSS/Epoxy/(KH560/$SiO_2$) coatings with different P:E:K ratios.