

Supplementary Information

Metal-Organic Decomposition-Mediated Nanoparticulate Vanadium Oxide Hole Transporting Buffer Layer for Polymer Bulk-heterojunction Solar Cells

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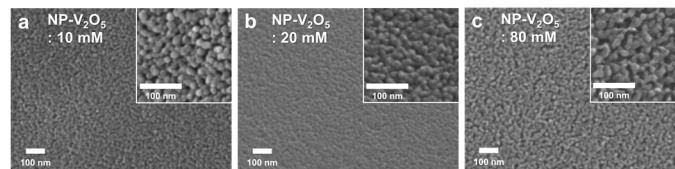


Figure S1. SEM images of NP-V₂O₅ films prepared by using various concentrations of PEG (a) 10 mM, (b) 20 mM, and (c) 80 mM.

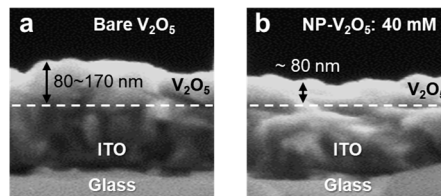


Figure S2. Cross-section SEM images of (a) bare V₂O₅ and (b) NP-V₂O₅ prepared using 40 mM PEG.

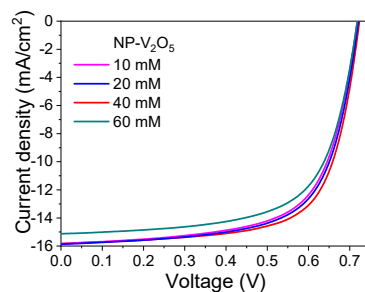


Figure S3. Photocurrent density–voltage curves of the OSCs with NP-V₂O₅ HTL prepared using various concentrations of PEG from 10 mM to 80 mM.

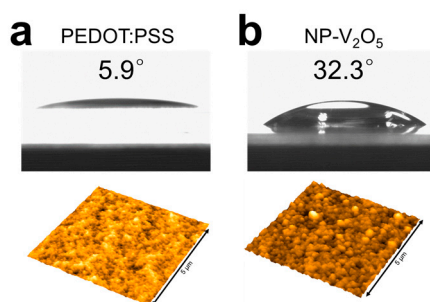


Figure S4. Contact angle and AFM images of water droplets (12 μ L) on the surface of (a) PEDOT:PSS and (b) NP-V₂O₅ films prepared using 40 mM PEG.

Table S1. Summary of the device performance parameters.

Devices ^{a,b}	V_{oc} (V)	J_{sc} (mA/cm ²)	FF (%)	PCE (%)
PEDOT:PSS	0.734 (± 0.01)	14.95 (± 0.02)	68.09 (± 0.11)	7.47 (± 0.09)
Bare V ₂ O ₅	0.562 (± 0.54)	10.06 (± 4.58)	20.70 (± 9.24)	1.24 (± 1.09)
NP-V ₂ O ₅ (10 mM PEG)	0.725 (± 0.07)	15.79 (± 0.04)	66.47 (± 0.24)	7.55 (± 0.22)
NP-V ₂ O ₅ (20 mM PEG)	0.723 (± 0.04)	15.84 (± 0.02)	67.12 (± 0.18)	7.68 (± 0.19)
NP-V ₂ O ₅ (40 mM PEG)	0.723 (± 0.05)	15.81 (± 0.03)	69.01 (± 0.15)	7.89 (± 0.11)
NP-V ₂ O ₅ (80 mM PEG)	0.717 (± 0.13)	15.10 (± 0.37)	66.04 (± 0.41)	7.15 (± 0.52)

^a The cell area was determined by using an aperture of area 11.43 mm². The aperture was placed on top of the cell (of approximately 15 mm²). These area values were carefully characterized with a video microscope (Sometch, SV-35). ^b The average values were obtained from 10 devices for each condition.