Electronic Supplementary Information for

Electron Transport in a Sequentially Doped Naphthalene Diimide Polymer

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I. Synthesis and Characterization of PNBS

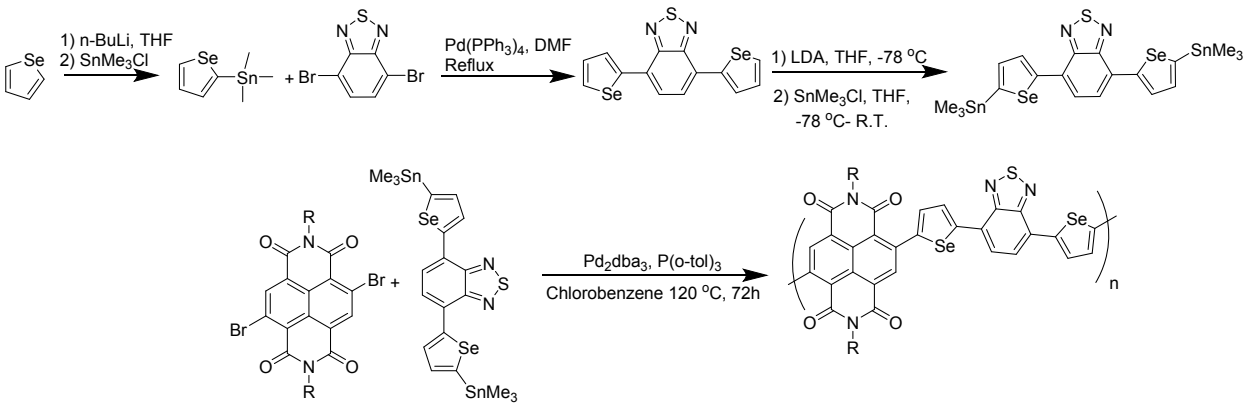

Figure S1. Synthesis of PNBS.

Table S1. Comparison of molecular weight characteristics of PNBS synthesized in this work and reported in the literature.

This work[a]	**Literature**
M_n= 42.8 kDa M_w= 86.1 kDa PDI=2.10	M_n = 39.7 kDa M_w = 147.6 kDa PDI = 3.72.

[a] Molecular weight of the synthesized polymer was analyzed via Gel Permeation Chromatography (GPC) using chloroform as an eluent. GPC sample was prepared by preparing 5 g L^{-1} solution of the polymer in 0.25% triethyl amine in chloroform (HPLC grade) and then filtered through a 20 µm PTFE filter before running the analysis.

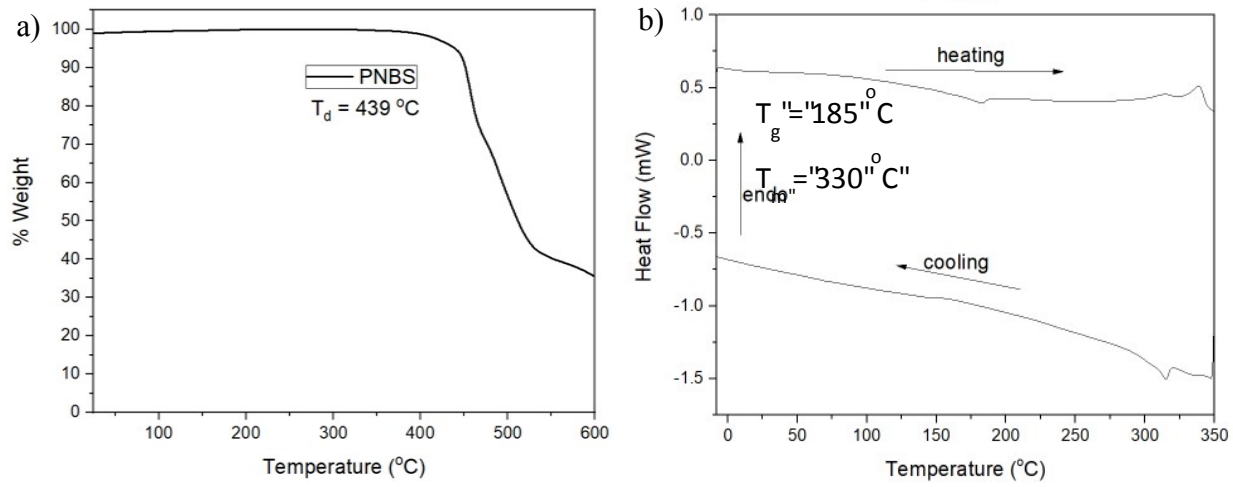

Figure S2. Characterization of PNBS by (a) thermogravimetric analysis and (b) differential scanning calorimetry (second heating/cooling cycle), acquired using Mettler Toledo instruments at a heating/cooling rate of 10 °C / min.

II. Additional UV-vis.-NIR Data

To compare the absorption of PNBS upon doping with N-DMBI-H to $(N\text{-}DMBI)_2$ samples prepared in a glovebox in Schlenk cuvettes were doped with different amounts of N-DMBI-H. The samples were then measured without heating. The samples were then heated for various times and measured.

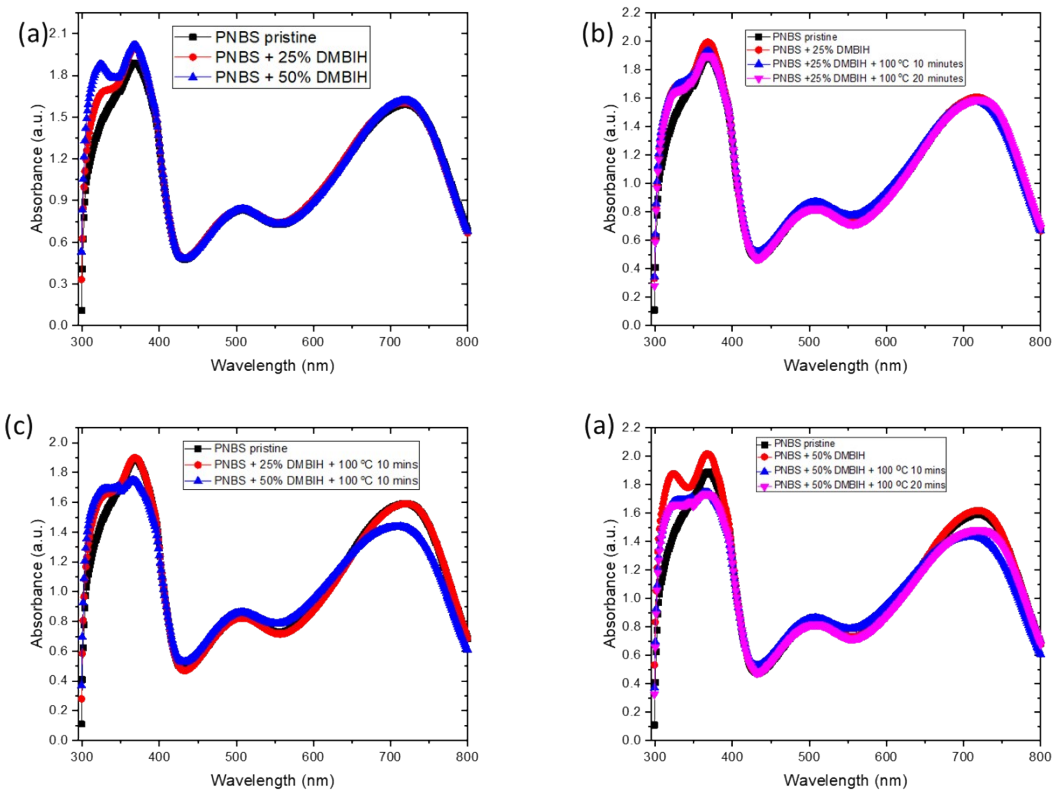

Figure S3. UV-vis.-NIR spectra showing reactivity of PNBS with N-DMBI-H in chlorobenzene. The samples were prepared in a nitrogen filled glovebox in schlenk cuvettes to avoid exposure to oxygen and moisture. (a) doping of PNBS with different concentrations of DMBI-H. (b) PNBS pristine solution absorption evolution upon doping with 25% DMBIH with and without heating of the sample. (c) Doped PNBS with DMBIH solutions in chlorobenzene were heated at 100 °C for 10 minutes. (d) PNBS pristine solution absorption evolution upon doping with 50% DMBIH with and without heating of the sample.

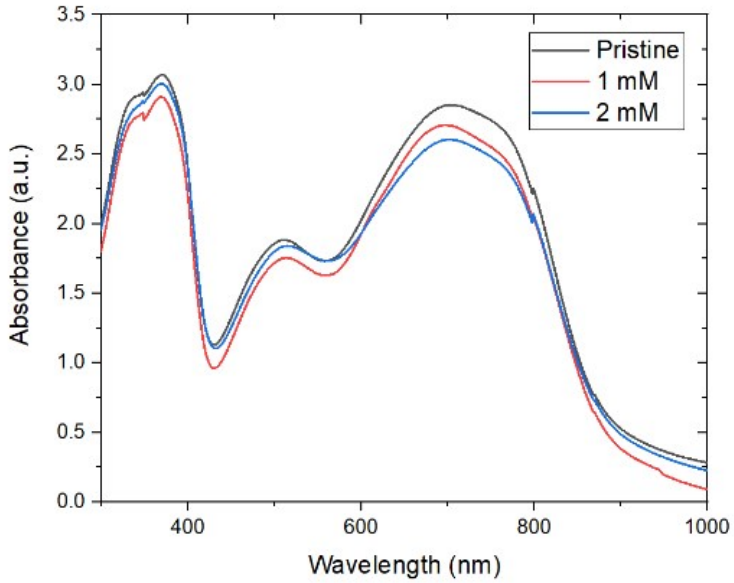

Figure S4. UV-Vis-NIR spectra of PNBS films sequentially doped with $(RuCp^*mes)_2$.

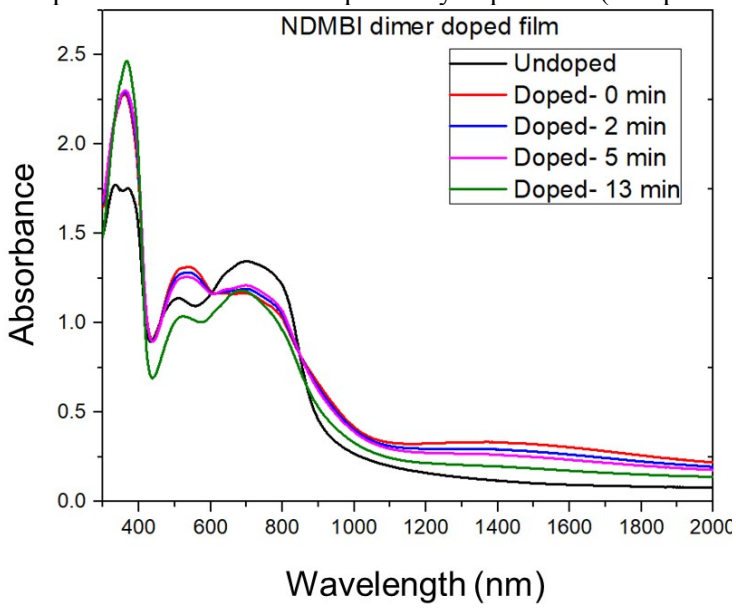

Figure S5. UV-Vis-NIR spectra of a PNBS film sequentially doped with $(N\text{-}DMBI)_2$ (5 mM) showing the effect of exposure to air for various times.

III. Additional XRD Data

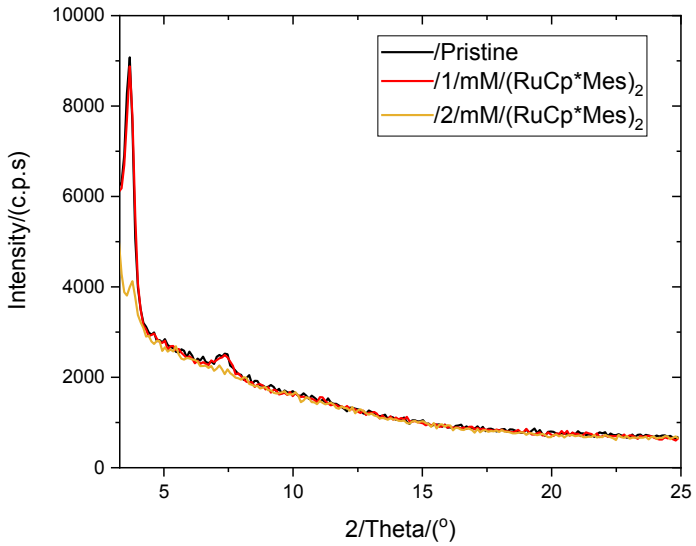

Figure S6. GIXRD of PNBS films sequentially doped with $(RuCp^*mes)_2$.

IV. AFM Data

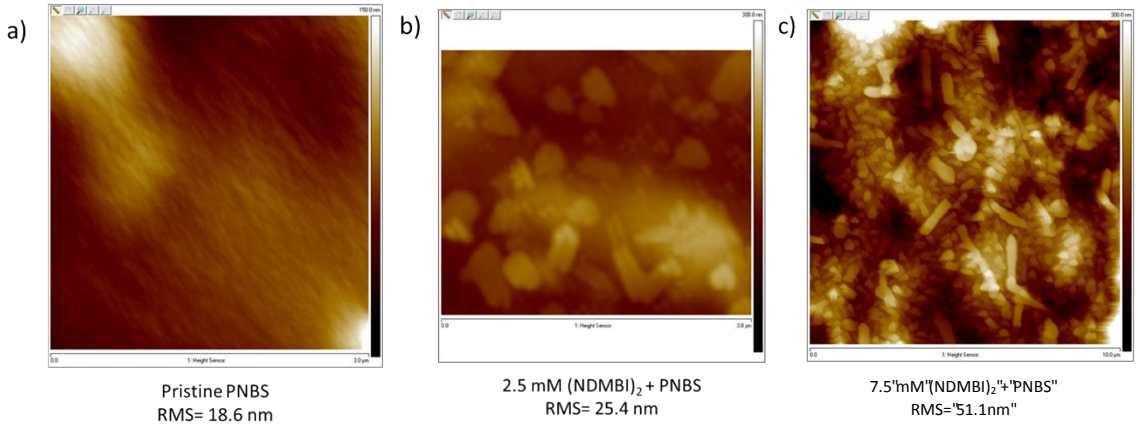

Figure S7. AFM images, using a Bruker AFM instrument in tapping mode, where the scan frequency was fixed to 0.5 Hz, measured for the pristine, lightly doped and highest conductivity doped $(N\text{-}DMBI)_2$ doped PNBS films. (a) Pristine PNBS, (b) 2.5 mM doped PNBS, (c) 7.5 mM doped PNBS.