Electronic Supplementary Information

Effect of Face-to-Face and Side-to-Side Interchain Interactions on the Electron Transport in Emeraldine Salt Polyaniline

Veinardi Suendo[*a,b], *Yenni Lau*[a], *Ferdinand Hidayat*[a], *Muhammad Reza*[a], *Albaaqi Qadafi*[a], *and Achmad Rochliadi*[a]

[a]Division of Inorganic and Physical Chemistry, Faculty of Mathematics and Natural Sciences, Institut Teknologi Bandung, Indonesia, Jl. Ganesha No. 10, Bandung 40132, Indonesia

[b]Research Center for Nanoscience and Nanotechnology, Institut Teknologi Bandung, Jl. Ganesha No. 10, Bandung 40132, Indonesia

Additional Figures

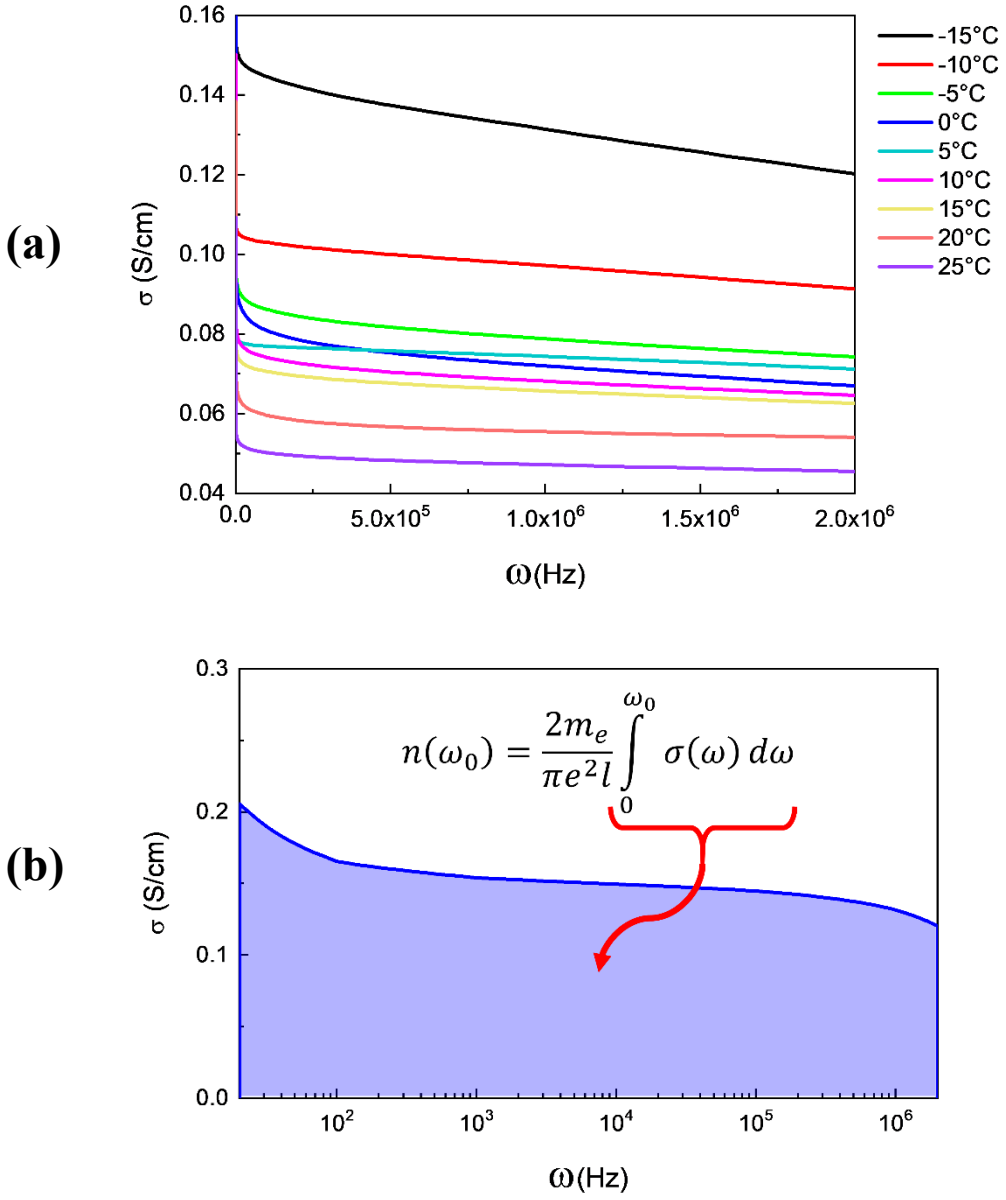

Figure S1. (a) Frequency response of conductivity data (Bode plot) of PANI-ES synthesized at various polymerization temperature. (b) Schematic illustration how to calculate the free electron's total density from the frequency response of conductivity data (Bode plot) using Equation 3.

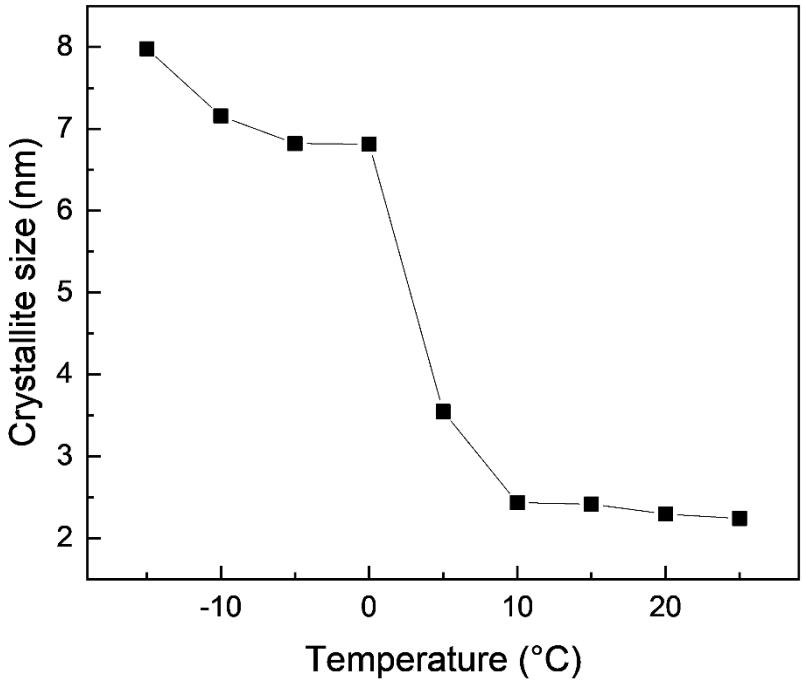

Figure S2. Crystallite size of PANI-ES synthesized at various polymerization temperature along the [110] direction determined using Scherrer equation ($k = 0.94$, $\lambda = 0.15418$)[1,2].

Additional Table

Table S1. Amorphous content of synthesized PANI-ES at various polymerization temperature determined by fitting the XRD pattern using a log-normal probability density function

Temperature (°C)	% Amorphous content (%)
-15	50.90
-10	52.22
-5	53.20
0	53.33
5	53.93
10	54.55
15	55.03
20	55.18
25	55.35

Table S2. Lattice parameter of PANI-ES determined by Le Bail method based on space group $P2_1$ in monoclinic crystal system

T (°C)	*a* (Å)	*b* (Å)	*c* (Å)	*β* (°)	$d_{\{(110)\}}$ (Å)
-15	6.8564	8.22	8.9536	98.5395	5.35721
-10	6.5041	7.8623	8.608	98.9042	5.33161
-5	6.5246	7.9019	8.635	98.7357	5.29391
0	6.6223	7.938	8.6902	98.5143	5.15258
5	6.5403	7.9153	8.6552	98.5146	5.11575
10	6.5398	7.9196	8.6543	98.5146	5.11623
15	6.5072	7.7753	8.5647	99.0248	5.30452
20	6.4445	7.6915	8.4162	98.5967	5.08521
25	7.1603	8.638	9.4912	99.0142	5.86851

References

1. F. T. L. Muniz, M. A. R. Miranda, C. Morilla dos Santos, J. M. Sasaki, *Acta Crystallographica Section A Foundations and Advances*, 2016, 72(3), 385–390.
2. J. I. Langford, A. J. C. Wilson, *J. Appl. Cryst*, 1978, 11, 102-113.