

Synthesis and characterization of new phenothiazine-based sensitizer/co-sensitizer for an efficient dye-sensitized solar cell performance using gel polymer electrolyte and Ni-TiO₂ as a photoanode

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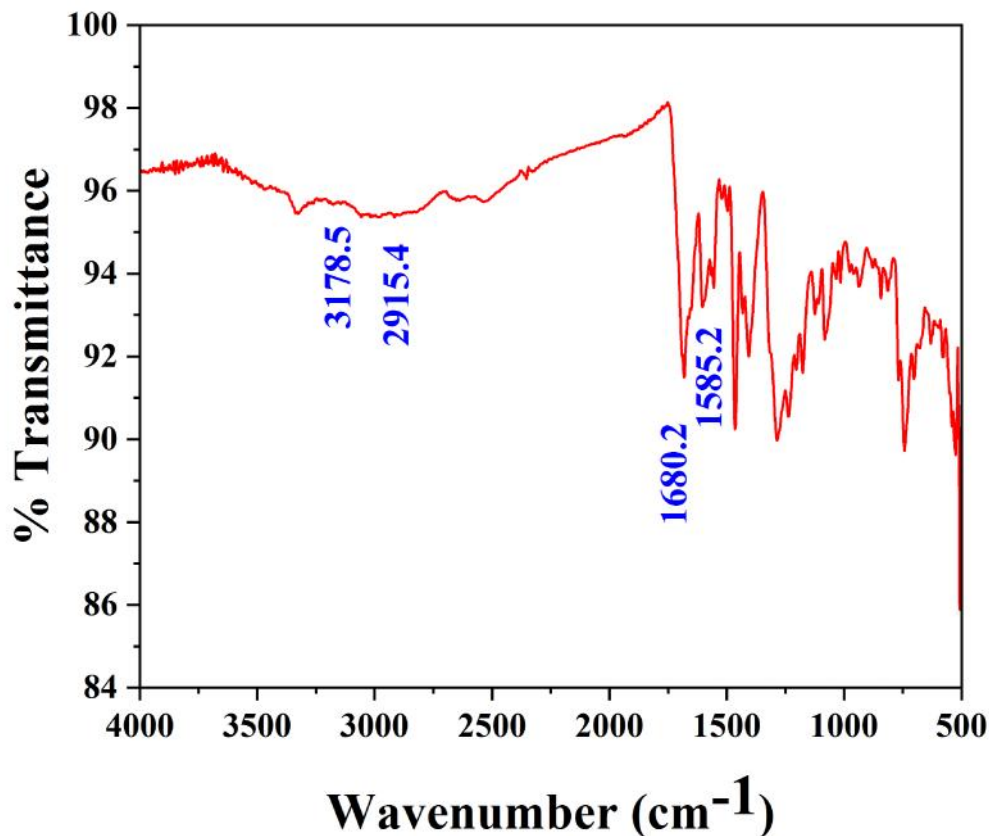


Fig. S1: IR spectra of POBA dye.

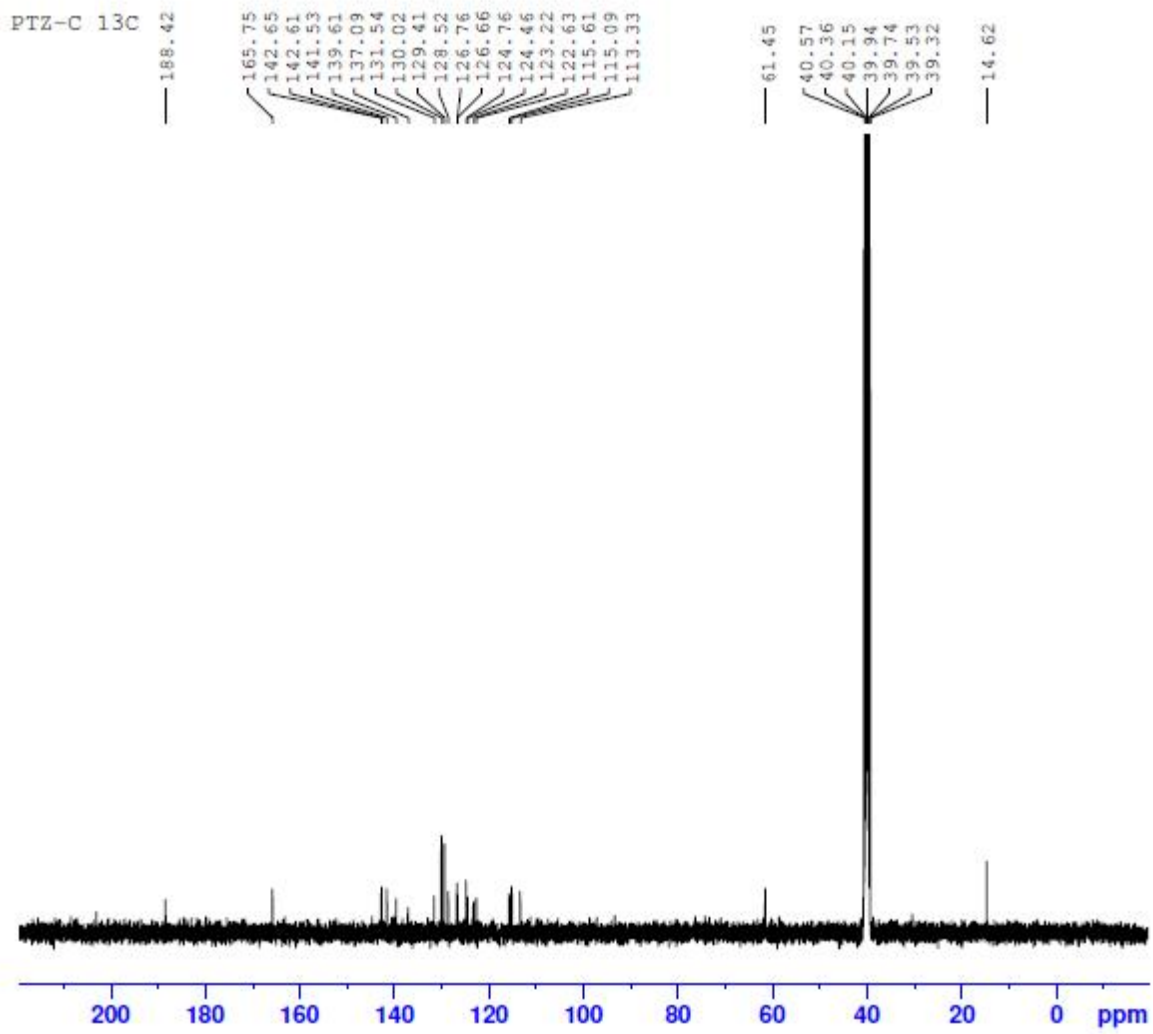


Fig. S3: ^{13}C spectra of POBA dye.

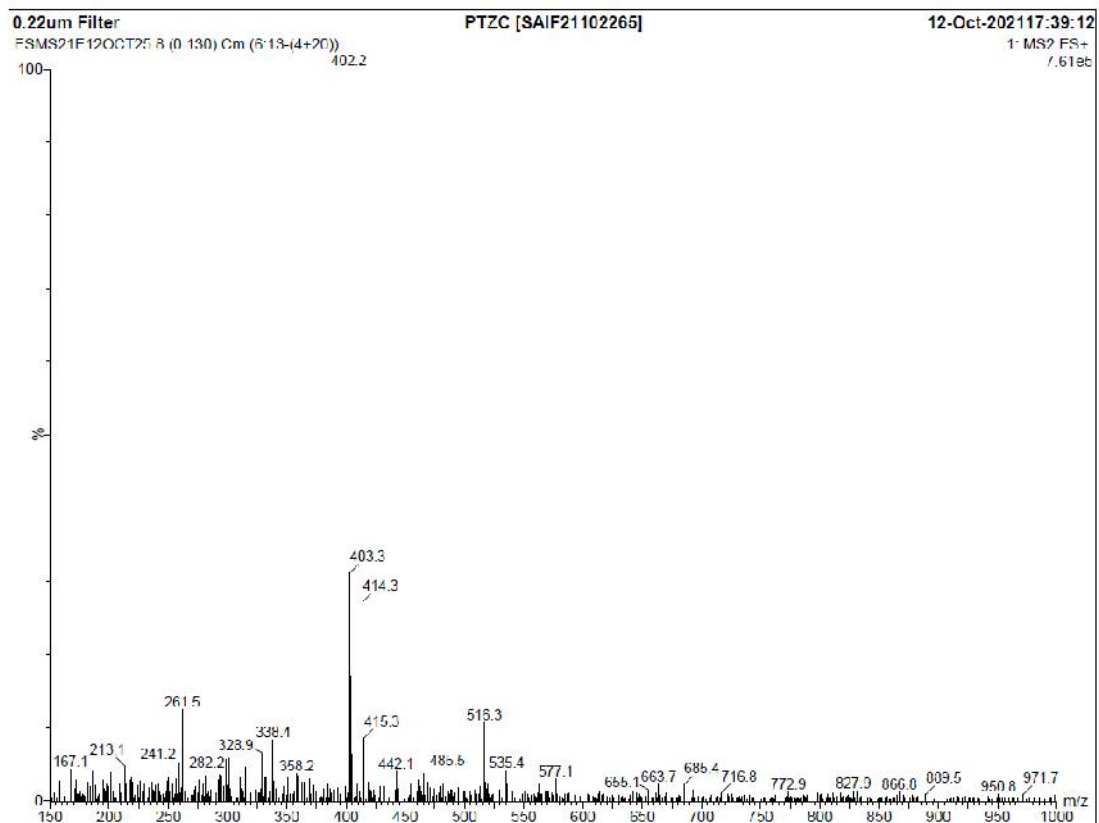


Fig. S4: Mass spectra of POBA dye.

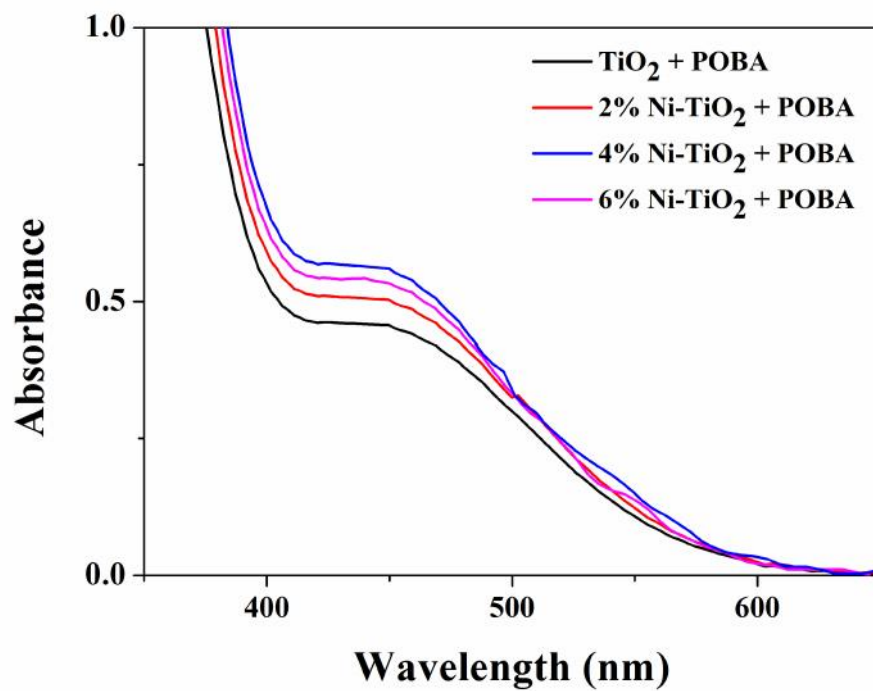


Fig. S5: Absorbance spectra of POBA dye anchored different pristine and doped TiO₂ films.

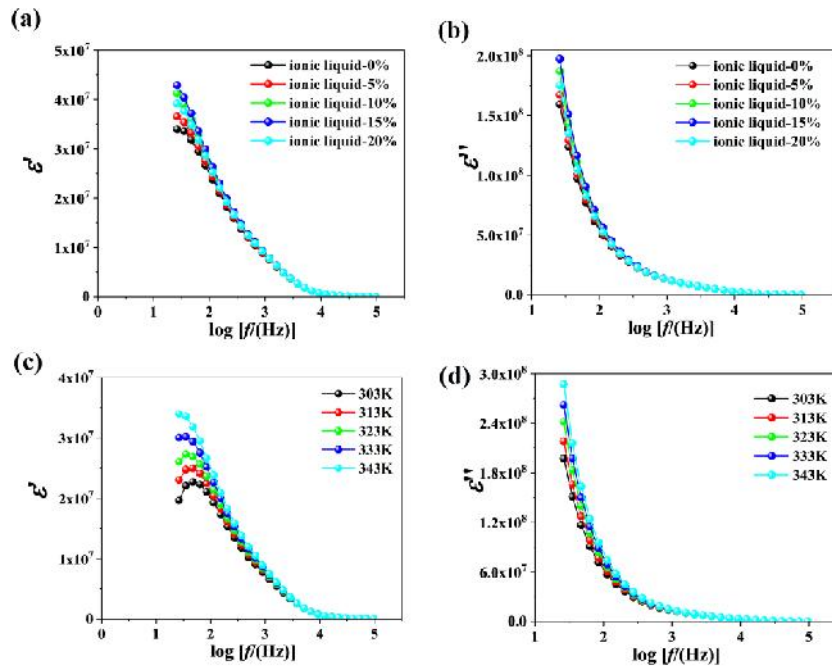


Fig. S6: (a) Variation of Z' with $\log f$ for each sample, (b) Variation of Z'' of each sample with $\log f$, (c) Variation of Z' of ionic liquid-15% at different temperatures with $\log f$ and (d) Variation of Z'' of ionic liquid-15% at different temperatures with $\log f$.

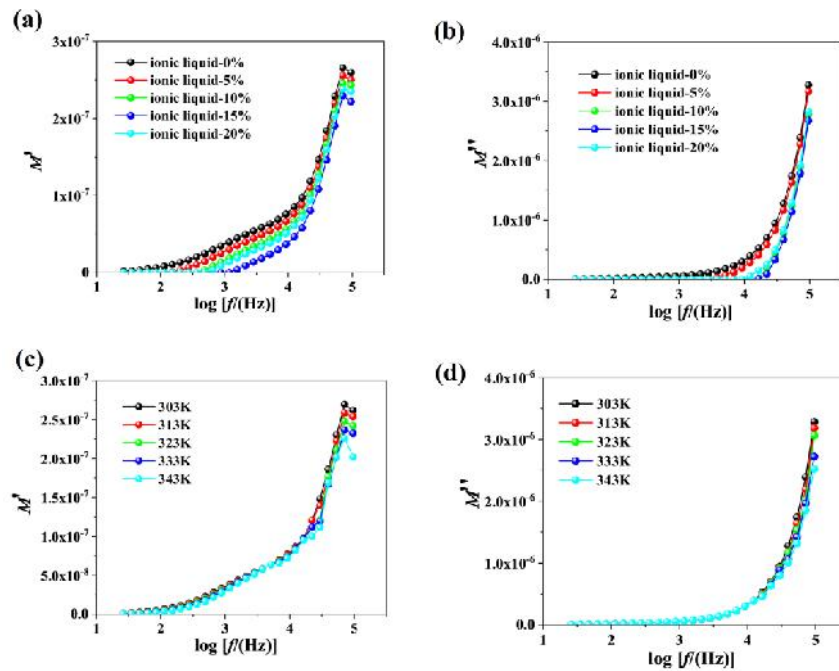


Fig. S7: (a) Variation of M' of each sample with $\log f$, (b) Variation of the imaginary part electrical modulus of each sample with $\log f$, (c) The M' of ionic liquid-15% at different temperatures with $\log f$, and (d) Variation of M'' of ionic liquid-15% at different temperatures with $\log f$.

Table S1: Photovoltaic characteristics of DSSCs with different bare TiO₂ film thicknesses sensitized with POBA dye (0.5 mM).

Thickness (μm)	V _{OC} (V)	J _{SC} (mA cm ⁻²)	FF %	PCE %
~5.5	0.61	3.04	53	0.98
~10.7	0.59	3.11	56	1.02
~15.3	0.59	3.57	57	1.21
~20.8	0.60	3.45	55	1.13

Table S2: Photovoltaic characteristics of DSSCs with different concentration of POBA dye.

Concentration (mM)	V _{OC} (V)	J _{SC} (mA cm ⁻²)	FF %	PCE %
0.3	0.56	3.41	54	1.03
0.5	0.59	3.57	57	1.21
0.7	0.57	3.51	55	1.10

Table S3: Photovoltaic characteristics of DSSCs with different concentration of co-sensitizer.

Concentration of Z907 (mM)	Concentration of POBA (mM)	V _{OC} (V)	J _{SC} (mA cm ⁻²)	FF %	PCE %
0.5	0.3	0.71	10.03	70	4.98
0.5	0.5	0.73	11.15	71	5.77
0.5	0.7	0.72	9.90	71	5.06

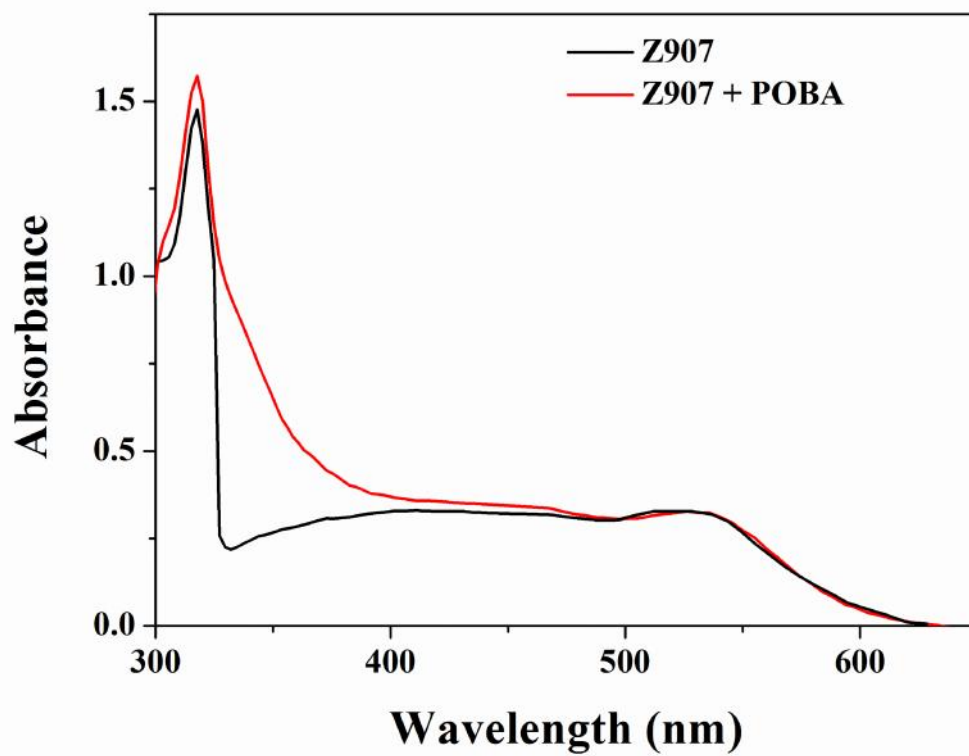


Fig. S8: Absorption spectra of Z907 and Z907 + POBA anchored onto 4% Ni-TiO₂.