Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Supplementary Materials of the Manuscript

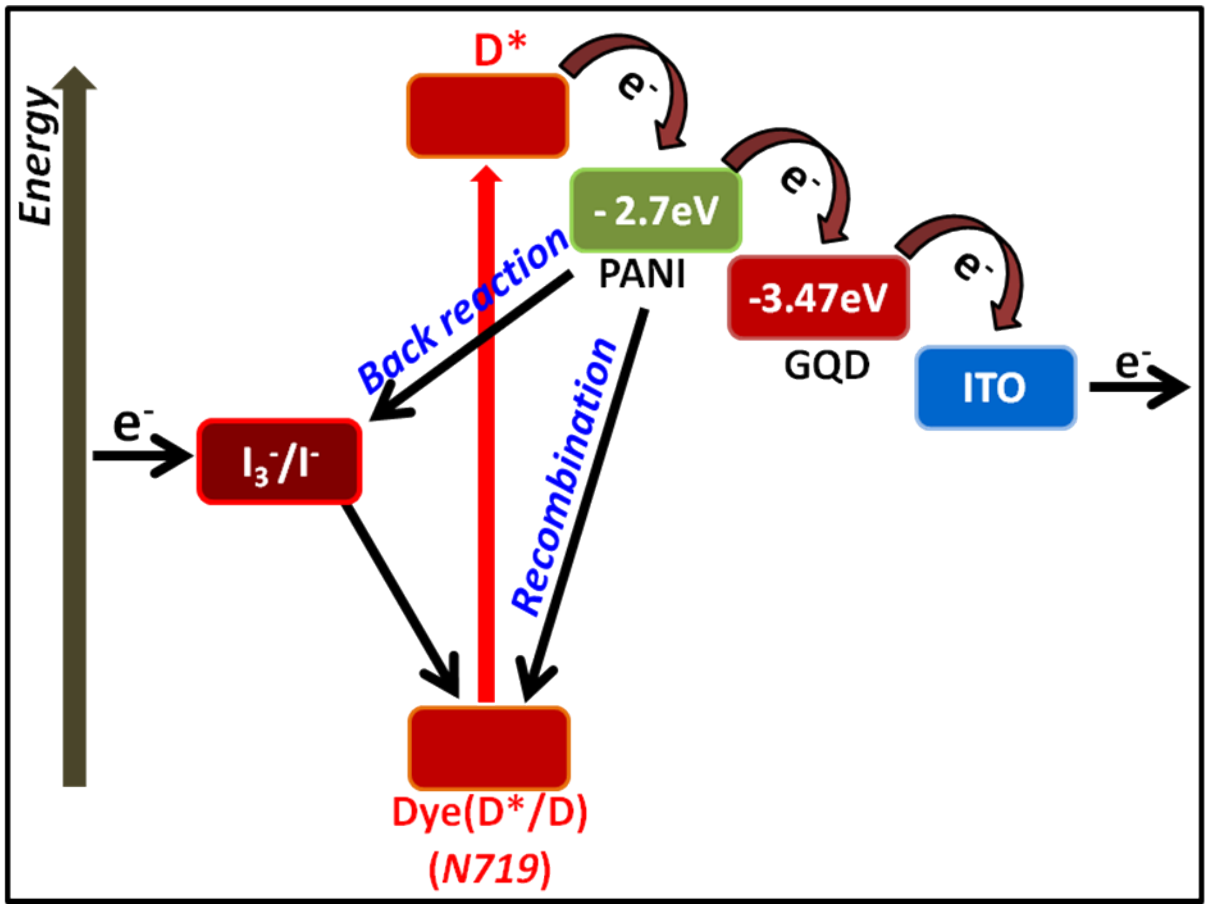
Opto-electronic and photovoltaic properties of graphene quantum dot-polyaniline nanostructure

Nabasmita Maity, Atanu Kuila, Sandip Das, Debasish Mandal, Arnab Shit

and Arun K. Nandi*

Polymer Science Unit, Indian Association for the Cultivation of Science, Jadavpur, Kolkata-700 032, INDIA

*For correspondence: Arun K. Nandi, Email: psuakn@iacs.res.in



Scheme S1: Operational mechanism of the PANI–GQDs based DSSC.

Table S1: 2θ and d-spacing values (Å) of GQDs, HCl doped PANI and different PAGD samples.

Sample Name	**d_{hkl}**		**d_{hkl}**		**d_{hkl}**		**d_{hkl}**		**d_{hkl}**		**d_{hkl}**		**d_{hkl}**	
	2θ	**d Å**	**2θ**	**d Å**	**2θ**	**d Å**	**2θ**	**d Å**	**2θ**	**d Å**	**2θ**	**d Å**	**2θ**	**d Å**
HCl doped PANI			9.3	**9.50**			14.8	**5.98**			20.9	**4.25**	25.5	**3.49**
PAGD1	6.4	**13.79**							19.1	**4.64**			25.4	**3.50**
PAGD2	6.4	**13.79**							19.1	**4.64**			25.5	**3.49**
PAGD3	6.5	**13.58**					15.3	**5.78**	18.9	**4.69**			25.5	**3.49**
PAGD5	**6.4**	**13.79**	**10.3**	**8.75**	12.3	**7.19**			19.3	**4.59**	21.4	**4.15**	26.1	**3.41**
GQD			10.3	**8.75**									25.4	**3.50**

Table S2: Comparison of parameters obtained from DSSCs of PAGD samples

Sample	Jsc (mA/cm^2)	Voc (V)	FF	PCE (%)
PAGD5	6.935	0.63	0.645	2.82
PAGD3	7.35	0.65	0.654	3.12
PAGD2	5.57	0.64	0.55	1.97
PAGD1	5.24	0.64	0.47	1.57

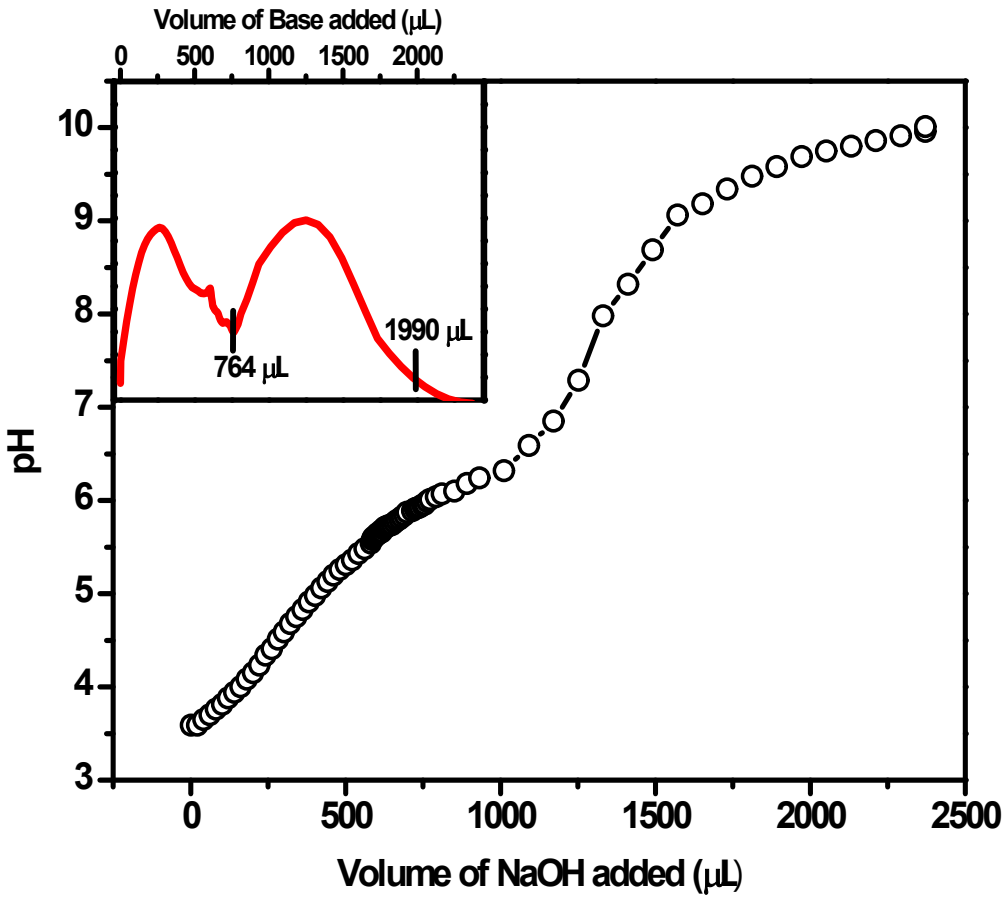


Figure S1: Titration curve for aqueous dispersion of GQDs.The inset shows derivatogram of titration.

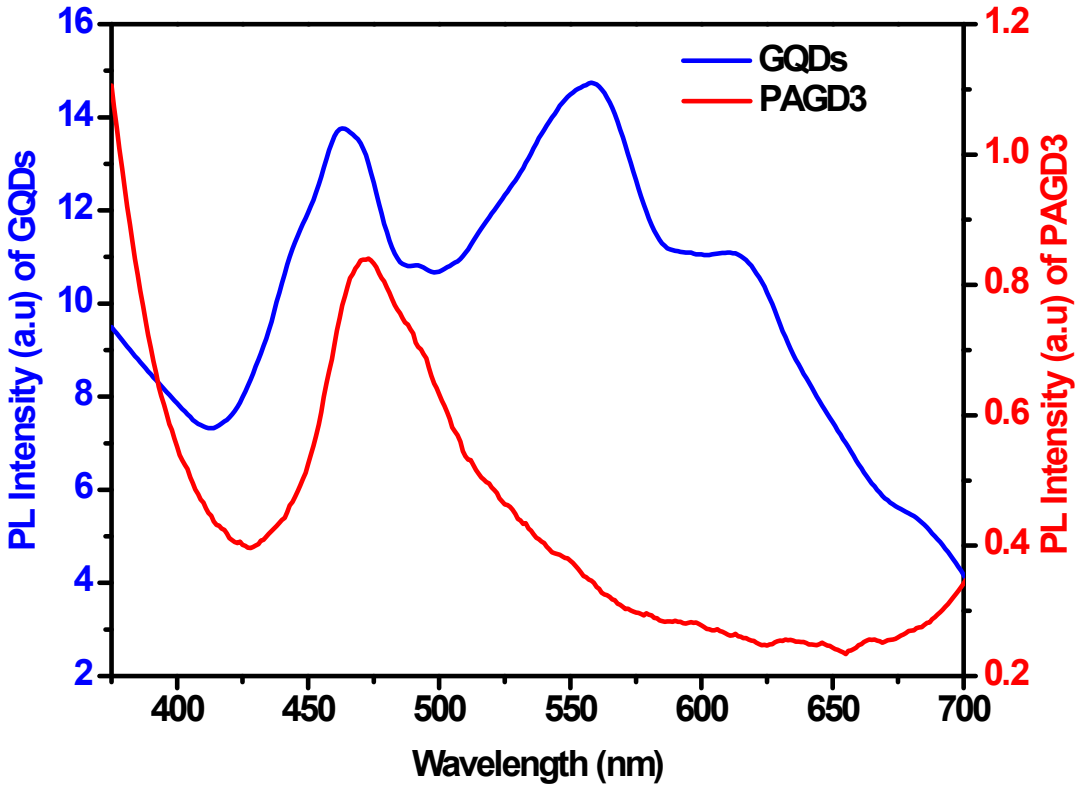


Figure S2: Fluorescence spectra of GQDs and PAGD3.

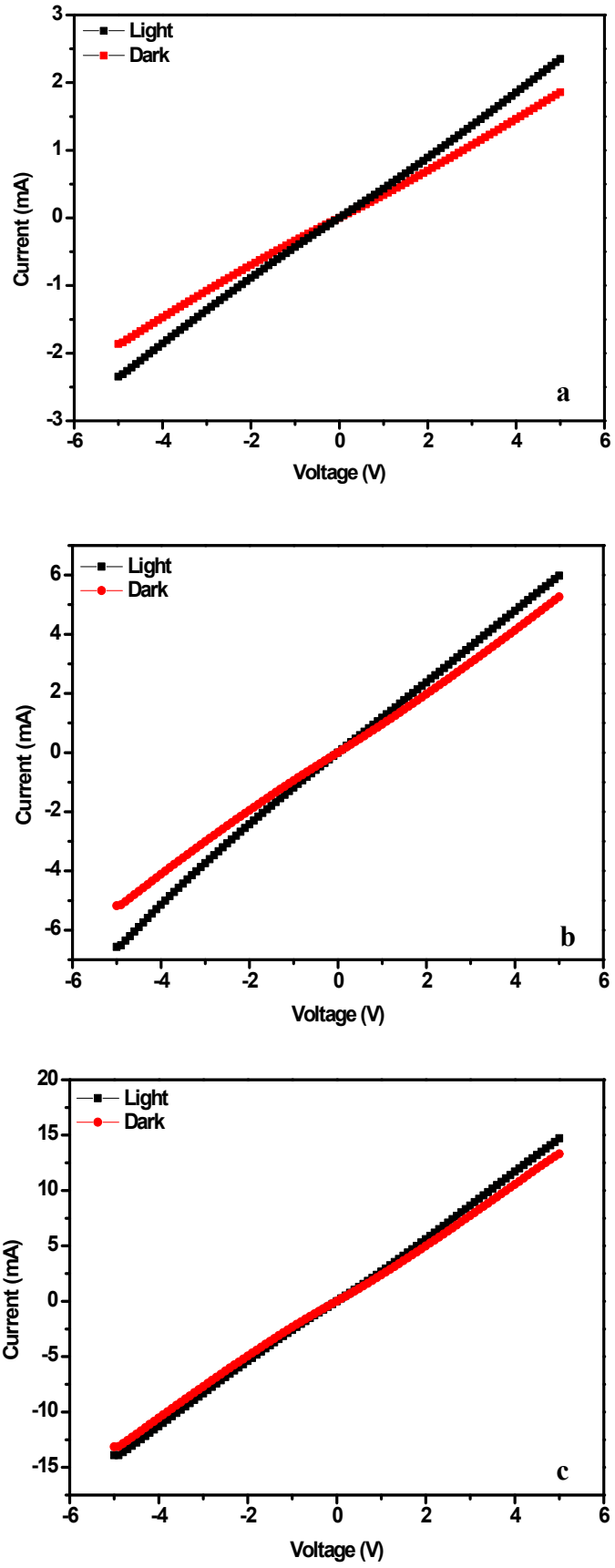


Figure S3: Current–voltage (I–V) plot of (a) PAGD5, (b) PAGD2 and (c) PAGD1 before and after white light irradiation.

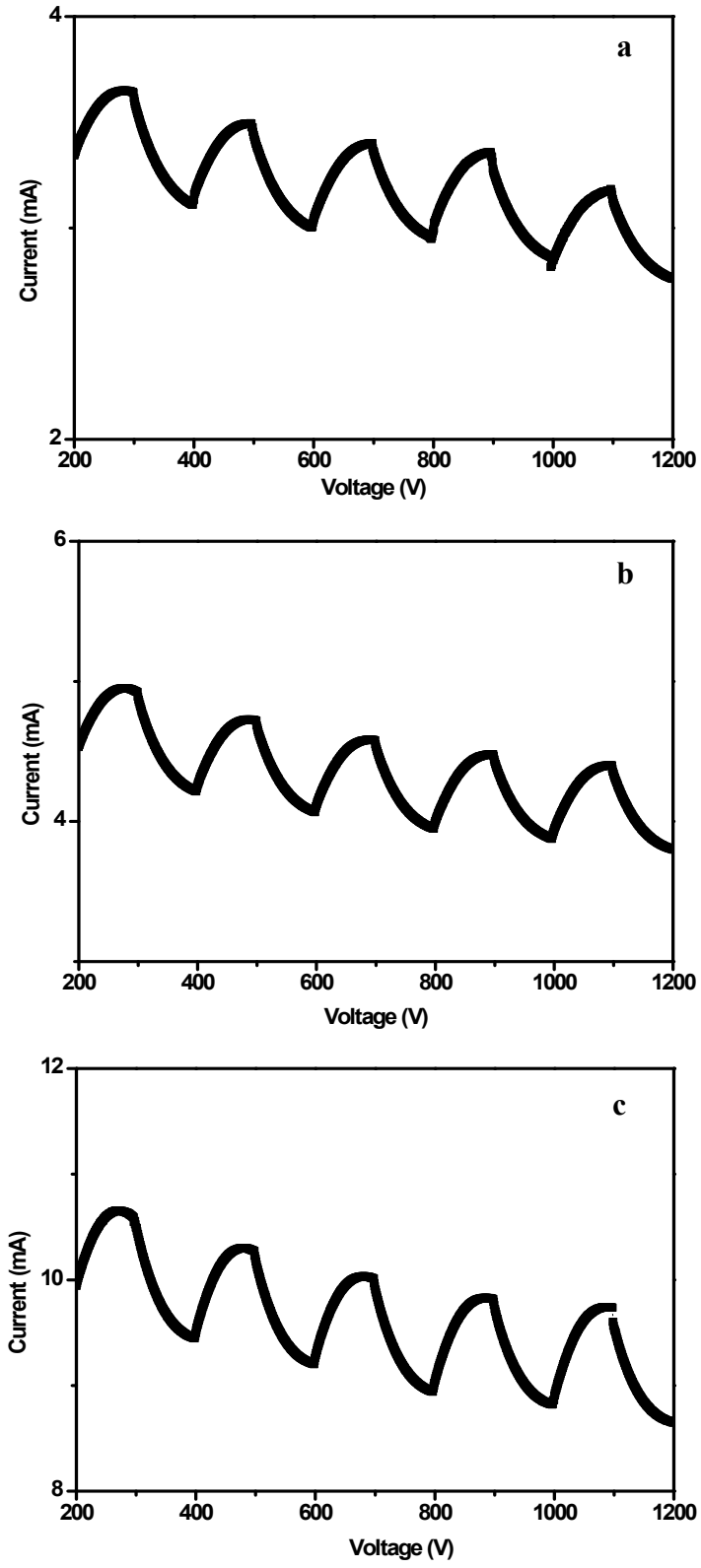


Figure S4: Photocurrent cycles of (a) PAGD5, (b) PAGD2 and (c) PAGD1 showing turn "on" and turn "off" by switching the white light illumination on and off, respectively.