Systematic Development, Synthesis and Application of New π-Conjugated Compounds for Organic Solar Cell Devices

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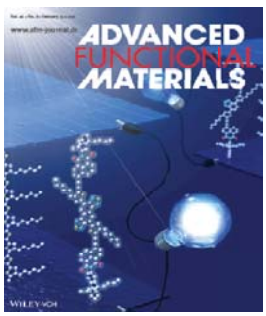
Abstract: Organic Solar Cell (OSC) is a promising alternative for clean and renewable energy due to their potential to be fabricated onto large area, light-weight flexible substrates by solution processing at low cost. Development of new π-conjugated systems has become a key factor for the advancement of OSC research into a next level upto commercialization. Systematic development and synthesis of new n-type π-conjugated compounds containing different building blocks such as 2,1,3-benzobisthiadiazole **(BTz)**, naphtho[1,2-*c*:5,6-*c*']bis[1,2,5]thiadiazole **(NTz),** fluorinated naphtho[1,2-*c*:5,6-*c*']bis[1,2,5]thiadiazole **(FNTz)** etc. their structure-property relationships will be discussed. Furthermore, application of these newly synthesized compounds as nonfullerene acceptor into OSC device with poly(3-hexyl thiophene) (P3HT) as a wide band gap donor will be presented in details.

References:

1. ***Shreyam Chatterjee***, Yutaka Ie, Takuji Seo, Taichi Moriyama, Gert-Jan A. H. Wetzelaer, Paul W. M. Bolm and Yoshio Aso *NPG Asia Materials* (Nature Publishing Group) **2018**, 10, 1016.
2. ***Shreyam Chatterjee***, Yutaka Ie, Yoshio Aso *ACS Omega.* **2018**, *3*, 5814.
3. ***Shreyam Chatterjee***, Yutaka Ie, Yoshio Aso *Journal of Photopolymer Science and Technology* **2017**, *30*, 557.
4. ***Shreyam Chatterjee***, Yutaka Ie, Makoto Karakawa and Yoshio Aso *Advanced Functional Materials* **2016**, 26, 1161 (One of the most accessed paper in 01/2016 in Advanced Functional Materials).
5. ***Shreyam Chatterjee***, Yutaka Ie, Makoto Karakawa and Yoshio Aso *Advanced Functional Materials* **2016**, 26, 1304. (Appeared as Back Cover picture)



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Education

Ph.D. 2013, Indian Association for the Cultivation of Science, (IACS), Kolkata, INDIA.
Polymer Science Unit (with Prof. Arun K. Nandi)

Professional Experience:

01.05.2018- till date	Post Doctoral Researcher: ISIR, Osaka University (with Prof. Yoshito Tobe)
16.05.2017- 31.03.2018	Specially Appointed ASSISTANT PROFESSOR: ISIR, Osaka University (with Prof. Yoshio Aso)
02.04.2013 – 15.05.2017	Post Doctoral Researcher: ISIR, Osaka University (with Prof. Yoshio Aso)

Current Research Interest:

Development (through DFT calculations), and ***synthesis*** of π-conjugated organic semiconductors (small molecule/ polymer) for the application in Organic Electronics such as ***Organic Solar Cells*** (OSCs), ***Organic Field-effect Transistors*** (OFETs) devices etc.

Representative Publications:

1. Shreyam Chatterjee *et al.* ***NPG Asia Materials*** 2018, 10, 1016.
2. Shreyam Chatterjee *et al.* ***ACS Omega.*** 2018, *3*, 5814.
3. Shreyam Chatterjee *et al.* ***Journal of Photopolymer Science and Technology*** 2017, *30*, 557.
4. Shreyam Chatterjee *et al.* ***Advanced Functional Materials*** 2016, 26, 1161
5. Shreyam Chatterjee *et al.* ***Advanced Functional Materials*** 2016, 26, 1304.
6. Shreyam Chatterjee *et al.* ***Journal of Material Chemistry A*** 2013, 1, 12302.
7. Shreyam Chatterjee *et al.* ***Carbon*** 2013, 52, 509.
8. Shreyam Chatterjee *et al.* ***Chemical Communications*** 2013, 49, 4646.
9. Shreyam Chatterjee *et al.* ***Chemical Communications*** 2011, 47, 11510.
10. Shreyam Chatterjee *et al.* ***Synthetic Metals*** 2011,161, 62.