Donor Functionalized 1,8-Naphtalimids

A THESIS

Submitted in partial fulfillment of the
requirements for the award of the degree
of
Master of Science

by

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CANDIDATE'S DECLARATION

I hereby certify that the work which is being presented in the thesis entitled **Donor Functionalized 1,8-Naphthalimids** in the partial fulfillment of the requirements for the award of the degree of **MASTER OF SCIENCE** and submitted in the **DISCIPLINE OF CHEMISTRY, Indian Institute of Technology Indore**, is an authentic record of my own work carried out during the time period from July 2014 to June 2016 under the supervision of Dr. Rajneesh Misra, Associate Professor, IIT Indore.

The matter presented in this thesis has not been submitted by me for the award of any other degree of this or any other institute.

Sharma

RAHUL SHARMA

This is to certify that the above statement made by the candidate is correct to the best of my/our knowledge.

Dr. RAJNEESH MISRA

Rahul Sharma has successfully given his/her M.Sc. Oral Examination held on.....

2/8/2016

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ABSTRACT

The design and synthesis of triphenylamine substituted 1,8-naphthalimide based donor acceptor (D-π-A and D-π'-A) systems was done by using Pd-catalyzed Sonogashira cross-coupling reaction. The starting materials, 4-ethynyl-N-alkyl-1,8-naphthalimides **1**, 4-[2-(4-Bromophenyl)-ethynyl]-N,N-diphenyl-Benzamine **2** were synthesized by Sonogashira coupling reaction. The photophysical and electrochemical properties of the triphenylamine-subatituted NPIs **3** and **4** were studied. The absorption spectra of the triphenylamine-substituted 1,8-naphthalimides (TPA-substituted NPIs) were recorded in chloroform. The UV-visible absorption spectra were in the range of 300-530 nm. The electrochemical studies shows one oxidation peak corresponding to the oxidation of triphenylamine unit and the reduction peak corresponds to the reduction of 1,8-naphthalimide moiety. The DFT calculation reveals the distribution of HOMOs over triphenylamine unit and LUMOs over 1,8-napthalimide unit.