

Subject **[Scdt] M.Tech. thesis defence of Naveen K Pawar: 3 PM Fri. 06.08.2021**

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Zoom link:

<https://zoom.us/j/93752229256?pwd=RFQvbDV4bGZuVjR6anFwZm42c1JZQT09>

Meeting ID: 937 5222 9256

Passcode: 250513

Dear Colleagues

Mr. Naveen Kumar Pawar, Roll no.: 18104064, an M.Tech. student from EE Department will defend his M.Tech. thesis on Friday, 6th August, 2021. The details are as follows:

Thesis Title: "Comparison of zinc oxynitride with zinc oxide as electron transport layer in P3HT:PCBM organic solar cell"

Date and time: 6th August, 2021 (Friday) from 3 PM to 4 PM.

The thesis defence will be held over Zoom. The link is provided above.

You are welcome to join the event over zoom.

With regard

S. Sundar Kumar Iyer (EE) and Anshu Gaur (MSE)  
Thesis Advisors

Abstract of the thesis

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An electron transport layer (ETL) in an organic solar cell should ideally allow electrons to transport through it and get collected efficiently at the cathode. Wider bandgaps and higher electron mobility values are desirable in layers used as ETL. In the poly (3-hexylthiophene) : [6,6] phenyl-C61 butyric acid methyl ester (P3HT:PCBM) bulk heterojunction organic solar cell, generally zinc oxide (ZnO) is popular choice for an ETL. Using ZnO as an ETL, however, requires, another material layer to function as the electrode (cathode). In this thesis, zinc oxynitride (ZnON) is explored as an alternative to ZnO as an ETL. ZnON has a tuneable bandgap, has higher electron mobility and can be used as an electrode as well.

P3HT:PCBM bulk heterojunction organic solar cell devices with ZnO and ZnON layers as ETL were compared by simulations as well as by fabricating organic solar cell devices. While the ZnO ETL device was indium tin oxide (ITO) layer as the cathode, the ZnON layer functioned as the ETL as well as the cathode in the devices studied. The results indicate ZnON maybe a suitable material for ETL which could help build better performing organic solar cells. Moreover, it might provide an option to build organic solar cells without requiring ITO layers, with potential cost advantages.

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