The one-dimensional charge transporting columnar mesogens for optoelectronic applications

Dharmendra Pratap Singh

Unité de Dynamique et Structure des Matériaux Moléculaires (UDSMM), Université du Littoral Côte d'Opale (ULCO), 50 Rue Ferdinand Buisson, 62228 Calais cedex, France

E-mail: Dharmendra.Singh@univ-littoral.fr

Recently, columnar mesogens have been emerged as Hole transport materials (HTMs) rendering a significant impact on the effectiveness of organic electronic devices [1,2]. The columnar mesogens exhibit hexagonal (Col_h) or rectangular (Col_r) columnar phases offering an impressive hole mobility in the order of 0.1 to 10^{-4} $cm^2V^{-1}s^{-1}$ which is found to be dexterous than most existing polymeric hole transport materials [2]. The charge transport mechanism is these mesogens is mainly governed by the hopping process in which electrons/holes unidirectionally migrates from one π-conjugated core to another [3]. This presentation describes the role of liquid crystalline columnar materials as HTL and their impact of the performance of optoelectronic devices.

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References

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Brief biographical note:

Dr. Dharmendra Pratap Singh is Associate Professor at the Université du Littoral Côte d'Opale, France and head of the 1st year of Industrial Engineering. He obtained his Ph.D. from the Lucknow University, India in 2016. His current research activities are liquid crystal materials and their nano & polymer composites for various applications in energy, optoelectronics, photovoltaics and organic electronics. He has published around 100 research articles and 4 book chapters. He is also serving as "Guest Editor" for the Journal of Molecular Liquids and Journal of Materials Chemistry C.