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Title:	Observation of disordered mesomorphism in three-ring-based highly polar bent-core molecules: design, synthesis and characterisation
Authors:	Mohiuddin, G. (/jspui/browse?type=author&value=Mohiuddin%2C+G.) Pal, S.K. (/jspui/browse?type=author&value=Pal%2C+S.K.) Kaur, Supreet (/jspui/browse?type=author&value=Kaur%2C+Supreet) Punjani, V. (/jspui/browse?type=author&value=Punjani%2C+V.)
Keywords:	Bent-core liquid crystals cybotactic cluster dielectrics electro-optics density functional theory three-ring
Issue Date:	2017
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Citation:	Liquid Crystals, 44 (14-15)
Abstract:	Research on low-temperature polar bent-core nematogens having lower molecular weight has gathered appreciable momentum by virtue of their significance in potential applications. However, the lack of availability and easy-to-perform synthesis processes appears to be the bottleneck towards their fabrication and thereby limiting their possible device applications. Hence, we have designed a new class of achiral symmetrical three-ring-based-bent shaped molecules incorporating an imine and ester linkage at the molecular bend with highly polar nitro/cyano terminal moiety exhibiting low-temperature nematic mesomorphism. The occurrence of disordered nematic mesomorphism has been confirmed by optical texture, differential scanning calorimetry scan and X-ray diffraction measurement. Dielectric spectroscopy and electro-optical investigation has also been carried out intending towards the potential applicability of the materials. Density functional theory analyses at the molecular level provide valuable information regarding the formation of the nematic mesophase and various parameters of the molecular spatial arrangement. Polarising optical microscopy study reveals the easy of alignment of these types of polar bent-core materials upon glass surface suitable for liquid-crystal-based sensing applications. Formation of mesophase with such a small bent molecule is rather difficult but we have successfully demonstrated the existence of disordered nematic mesomorphism at relatively low temperature.
Description:	Only IISER authors are available in the record.
URI:	https://www.tandfonline.com/doi/full/10.1080/02678292.2017.1363917 (https://www.tandfonline.com/doi/full/10.1080/02678292.2017.1363917) http://hdl.handle.net/123456789/1687 (http://hdl.handle.net/123456789/1687)
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