4.d.4. Conclusion:
Cu (II) complexes of the azo functionalised four ring unsymmetrical bent-core compounds and substituted four ring unsymmetrical bent-core compounds was successfully synthesized and characterized. All the ligands exhibit wide range of enantiotropic nematic phase. The unsubstituted copper complexes exhibit enantiotropic as well as monotropic nematic phase. The unsubstituted copper (II) complexes of the homologous series [n-2M-OM]_2Cu having lower chain length (n = 4-5) and higher chain length (n = 10-12, 14, 16 and 18) exhibit monotropic nematic phase whereas the enantiotropic nematic phase was observed in complexes with moderate chain length (n = 7-9). All the substituted copper (II) complexes of the homologous series [n-2M-oM-OM]_2Cu and [n-2M-mM-OM]_2Cu exhibit monotropic nematic phase whereas its corresponding ligands exhibit enantiotropic nematic phase. The nematic phase range is smaller in complexes than its ligands. In substituted copper complexes the crystal to isotropic phase transition temperature in heating cycle is much larger than the isotropic to nematic phase transition temperature in the cooling cycle. In substituted complexes the mesophase exists up to room temperature. In the formation of copper (II) complex two bent-shaped molecules paired up in reverse direction to form the complex with the metal ion. Further investigations by X-ray diffraction (XRD) are in progress to investigate the detailed structure of these mesomorphic phases and to explore the possible applications of these materials.