Reversible optical storage material using photo-responsive rod-like molecules nanosegregated in the B4 structure of achiral banana-shaped molecule

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Stable photo-rewriting property in a mixture system consisting of banana-shaped molecule and photo-responsive rod-like molecule has been studied. Optical activity show the following characteristics: (1) the origin of optical activity is due to chiral-segregated banana-shaped molecules in the B4 phase, where rod-like molecule is in the nematic phase; (2) the reduced optical activity is detected in the B4 phase, where the rod-like molecule is in the isotropic phase by irradiation with ultraviolet (UV) light; (3) the optical activity is recovered in the B4 phase, where the rod-like molecule is in nematic phase by irradiation with visible light. In this way, the optical activity was modulated by alternating irradiation with UV light and visible light. This result indicates that our material can be used as a reversible optical storage material due to this stable chiral-optical property.