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Spontaneous Chirality Conversion of [5]Thiaheterohelicene in Charge-Transfer Complexes in SDS Micelles.

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Racemic 2-hydroxymethylthieno[3,2-e:4,5-e']di[1]benzothiophene(5HM) with a labile helical structure was incorporated into aqueous SDS micelles containing (R)-2-(2,4,5,7-tetranitrofluoren-9-ylideneaminooxy)propionic acid (TAPA) to exhibit intense induced CD (ICD). Negative Cotton effects of the ICD gradually changed to reversed Cotton effects with time or sonication. This phenomenon of chirality conversion was attributable to conformational alterations of 5HM from an (M) helix to a (P), accompanied by compositional alterations of 5HM-(R)TAPA charge-transfer (CT) complexes from 1/2 to 1/1. The conversion rate from the (M) enantiomer to the (P) was obtained from the change of the ICD intensities with time and the chiral discrimination energy exerted in the 1:1 CT complex was estimated from the temperature dependence of the ICD intensities.