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Magnetoelectric coupling in 4, 4'-stilbenedinitrene[1] J.L. MUSFELDT, O. GUNAYDIN-SEN, P. CHEN, J. FOSSO-TANDE, University of Tennessee, T. ALLEN, University of Massachusetts, J. CHERIAN, T. TOKUMOTO, S. MCGILL, National High Magnetic Field Laboratory, P.M. LAHTI, University of Massachusetts, R.J. HARRISON, University of Tennessee — We investigated the optical properties of 4,4′-stilbenedinitrene at low temperature and in high magnetic fields and compared the results with complementary first principles calculations. Both physical tuning parameters allow us to manipulate the singlet-triplet equilibrium, and by so doing, control the optical contrast (which is on the order of -2.5×10^2 cm^{-1} at 555 nm and 35 T). Moreover, analysis of the magneto-optical response using a combined population and Beer's law framework reveals the singlet-triplet spin gap and identifies particular features in the absorption difference spectrum as deriving from singlet or triplet state excitations. These findings deepen our understanding of coupling in open shell molecules and show how highlight opportunities where chemical structure modification can amplify charge-spin interactions in organic biradicals.

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