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For characterization and comparison of switchable molecules it would be very useful to define an intrinsic cyclability of the molecules, independent of the optical system. This “ideal cyclability” would specify how often on average a single molecule could be switched before it undergoes a destructive side reaction. As the photodestruction is only caused by the UV light, the critical switching step is the photocolouration. An upper limit to the ideal cyclability can thus be obtained by measuring the ratio of the UV-induced photocolouration and photodestruction quantum yields of the transparent molecules ( $Z_{50,ideal} = \Phi_{photocol}/\Phi_{destr,tr}$ ). To measure  $\Phi_{destr,tr}$  instead of  $\Phi_{destr,col}$  the measurement in Sec. 4.2 can be modified such that most molecules stay in the transparent state by using e.g. reduced UV power.

### Acknowledgments

Financial support by the EC (STREP “CHIMONO”) and the DFG (Research Unit 557) is gratefully acknowledged. We would also like to thank C. Dan for his contribution in the early stages of the experiments and R. Herges, K. Meerholz, and E. Maibach for valuable discussions.