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On the Use of Diarylmaleimide Derivatives in Biological Contexts: An Investigation of the Photochromic Properties in Aqueous Solution

Cassandra Fleming^a, Patricia Remón^a, Shiming Li^a, Nadja Anita Simeth^b,

Burkhard König^b, Morten Grøtli^{c,*} and Joakim Andréasson^{a,*}

^a Department of Chemistry and Chemical Engineering, Physical Chemistry, Chalmers University of Technology, SE-412 96, Göteborg, Sweden.

^b Institute of Organic Chemistry, University of Regensburg, 93040, Regensburg, Germany

^c Department of Chemistry and Molecular Biology, University of Gothenburg, SE-412 96, Göteborg, Sweden

*Corresponding authors. E-mail addresses: a-son@chalmers.se (J. Andréasson), grotli@chem.gu.se (M. Grøtli)

Abstract

A series of photochromic diarylmaleimide derivatives has been synthesized and studied with respect to the photochromic properties in aqueous solution. The main rationale is to investigate if these compounds could be used as photoswitchable units in biological contexts, motivated by the fact that the diarylmaleimide structural motif is identified in many pharmacophores. Thus, photoswitchable variants of this class of compounds could be very useful in the quest for photoactivatable drugs. The photoinduced cyclization reaction (colorization) is suppressed in solvents of high polarity, whereas the ring-opening reaction (decolorization) still occurs with high efficiency. The photochromically active anti-parallel conformer of the open form is more abundant in the asymmetrically substituted derivatives, which in turn favors the formation of the closed isomeric form. The rates of the thermal isomerization reactions have also been assessed, together with the resistance toward thermal

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