Competing adiabatic and nonadiabatic pathways in the cis-trans photoisomerization of cis-1,2-di(1-methyl-2-naphthyl)ethene

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Electronic Supplementary Information Available: Figures giving the T dependence of MCH density (Fig. 1S, Table 1S), the typical fluorescence intensity dependence of emission from c-D-1-MNE solutions on excitation intensity (Fig. 2S), typical fluorescence decay profiles following pulsed excitation (Fig. 3S) and the dependence of the t-D-1-MNE fluorescence spectrum on excitation wavelength (Fig. 4S).
Table 1S: MCH Density Dependence on $T^a$

<table>
<thead>
<tr>
<th>$t$, °C</th>
<th>$d^a$</th>
<th>$t$, °C</th>
<th>$d^a$</th>
</tr>
</thead>
<tbody>
<tr>
<td>-95.1</td>
<td>0.86893</td>
<td>25</td>
<td>0.764697</td>
</tr>
<tr>
<td>-63.5</td>
<td>0.84144</td>
<td>29.95</td>
<td>0.76046</td>
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<tr>
<td>-45.2</td>
<td>0.82561</td>
<td>45.2</td>
<td>0.74702</td>
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<tr>
<td>-22.9</td>
<td>0.80638</td>
<td>60.7</td>
<td>0.7336</td>
</tr>
<tr>
<td>0</td>
<td>0.78658</td>
<td>79.75</td>
<td>0.7166</td>
</tr>
<tr>
<td>15</td>
<td>0.773465</td>
<td>99.5</td>
<td>0.69825</td>
</tr>
</tbody>
</table>


![Graph](image)

Figure 1S: Quadratic fit of MCH density dependence on $T$ (data from Table 2S).

![Graph](image)
**Fig. 2S.**

a) Typical results of fluorescence spectra from a c-D-1-MNE solution in MCH as a function of neutral density filter absorbance.  
b) The log-log plot of relative fluorescence area to relative incident light intensity (25.0 °C, \( \lambda_{\text{exc}} = 313 \text{ nm} \), 1.00 cm cell).  
c) Quadratic plot of fluorescence area vs. relative excitation intensity.

\[
\begin{align*}
F & = 797.04x^2 + 3841.8x \\
R^2 & = 0.9992
\end{align*}
\]
Fig. 3S. Emission decay profiles of c- (black) and t-D-1-MNE (red) in argon saturated MCH (a), TOL (b), AN (c) and DMSO (d) ($T = 23.4$ °C, $\lambda_{exc} = 295$ nm, $\lambda_{mon} = 400$ nm, prompt is shown in blue).
**Fig. 4S.** a) Normalized (with respect to area) emission spectra of t-D-1-MNE in MCH at different excitation wavelengths ($\lambda_{exc} = 260 – 375$ @ 5 nm interval, 25.0 °C, 1.0 cm standard quartz cell); b) Spectra for $\lambda_{exc} = 260$ nm (red), 270 nm (blue) and 365 nm (green), illustrating the maximum observed variation.