Electronic Supplementary Material (ESI) for Photochemical & Photobiological Sciences. This journal is © The Royal Society of Chemistry and Owner Societies 2018

Electronic Supplementary Information

Photophysical properties of diethylhexyl 2,6-naphthalate

(Corapan TQ), a photostabilizer for sunscreens

Ryohei Shimizu^a, Mikio Yagi^{*a}, Nozomi Oguchi-Fujiyama^b, Kazuyuki Miyazawa^b, Azusa Kikuchi^{*a}

- ^a Department of Chemistry, Graduate School of Engineering Science, Yokohama National University, Tokiwadai, Hodogaya-ku, Yokohama 240-8501, Japan
- ^b Shiseido Global Innovation Center, Hayabuchi, Tsuzuki-ku, Yokohama 224-8558, Japan.



Figure S1 (a) UV absorption, (b) fluorescence–excitation ($\lambda_{em} = 375$ nm) and (c) phosphorescence–excitation ($\lambda_{em} = 560$ nm) spectra of 2-NA in ethanol at 77 K.



Figure S2 (a) Total emission ($\lambda_{ex} = 290 \text{ nm}$) and (b) phosphorescence ($\lambda_{ex} = 334 \text{ nm}$) spectra of 2-NA and (c) phosphorescence spectrum of naphthalene ($\lambda_{ex} = 313 \text{ nm}$) in ethanol at 77 K.



Figure S3 (a) Steady-state EPR spectrum for the T₁ state of 2-NA in ethanol at 77 K. (b) Computersimulated steady-state EPR spectrum obtained by using D = 0.0987 cm⁻¹, E = -0.0211 cm⁻¹ and v = 9209 MHz.



Figure S4 (a) Time-resolved phosphorescence spectrum of singlet oxygen generated by excitation of 2-NA in air-saturated ethanol at 25 °C. The sampling times were set at 1–16 μ s after the 355 nm YAG laser pulse. (b) Time profile of the phosphorescence monitored at 1274 nm.



Figure S5 Fluorescence decay curve of DEHN in air-saturated ethanol at 25 °C (•••••••: fluorescence, •••••••: lamp, ——: deconvolution). Fluorescence was monitored at 379.5 nm.



Figure S6 Fluorescence decay curve of 2-NA in air-saturated ethanol at 25 °C (•••••••: fluorescence, •••••••: lamp, ——: deconvolution). Fluorescence was monitored at 360.0 nm.