

SUPPORTING INFORMATION

Synthesis and Fast Electron-Transfer Reactions of Fullerene-Carbazole Dendrimers with Short Linkages

Mohamed E. El-Khouly,^{a*} Sang-Ho Lee,^b Kwang-Yol Kay^{b,*} and Shunichi Fukuzumi^{c,d,*}

^a*Department of Chemistry, Faculty of Science, Kafr ElSheikh University, Kafr ElSheikh 33516, Egypt*

^b*Department of Material and Life Science, Graduate School of Engineering, Osaka University, ALCA, Japan Science and Technology Agency (JST), Suita, Osaka 565-0871, Japan*

^c*Department of Molecular Science and Technology, Ajou University, Suwon 443-749, Korea*

^d*Department of Bioinspired Science, Ewha Womans University, Seoul 120-750, Korea*

Figure captions

Figure S1. MALDI-TOF mass spectra of compound **1**.

Figure S2. MALDI-TOF mass spectra of compound **2**.

Figure S3. MALDI-TOF mass spectra of compound **3**.

Figure S4. Rise profile of the $C_{60}^{\cdot-}$ of **1** at 1000 nm shown in Figure 4, monitoring charge separation process.

Figure S5. Decay profile of the $C_{60}^{\cdot-}$ at 1000 nm of **2** in PhCN, monitoring charge separation from carbazole to the singlet C_{60} .

Figure S6. Decay Profiles of the C_{60} radical anion at 1000 nm of **1** (upper figure), **2** (middle figure), and **3** (lower figure) in deaerated DMF. The concentrations are kept at 1.0×10^{-4} M; $\lambda_{ex} = 390$ nm.

Figure S7. (a) CV and (b) DPV of **1** (1.0×10^{-4} M) in deaerated PhCN with TBAPF₆ (0.1 M) as support electrolyte in PhCN. Scan rate = 20 mV/s.

Figure S8. (a) CV and (b) DPV of **2** (1.0×10^{-4} M) in deaerated PhCN with TBAPF₆ (0.1 M) as support electrolyte in PhCN. Scan rate = 20 mV/s.

Figure S9. (a) CV and (b) DPV of **3** (1.0×10^{-4} M) in deaerated PhCN with TBAPF₆ (0.1 M) as support electrolyte in PhCN. Scan rate = 20 mV/s.

Figure S10. Optimized Frontier molecular orbitals of **1** obtained by using *ab initio* B3LYP/6-311G method.

Figure S11. Optimized Frontier molecular orbital of **2** obtained by using *ab initio* B3LYP/6-311G method.

Figure S12. (Upper figure) Nanosecond transient absorption spectra of **1** (1.0×10^{-4} M) in deaerated PhCN; $\lambda_{ex} = 430$ nm. (Lower figure) Decay profile of $^3C_{60}^*$ at 700 nm.

Figure S13. (Upper figure) Nanosecond transient absorption spectra of **2** (1.0×10^{-4} M) in deaerated PhCN; $\lambda_{ex} = 430$ nm. (Lower figure) Decay profile of $^3C_{60}^*$ at 700 nm.

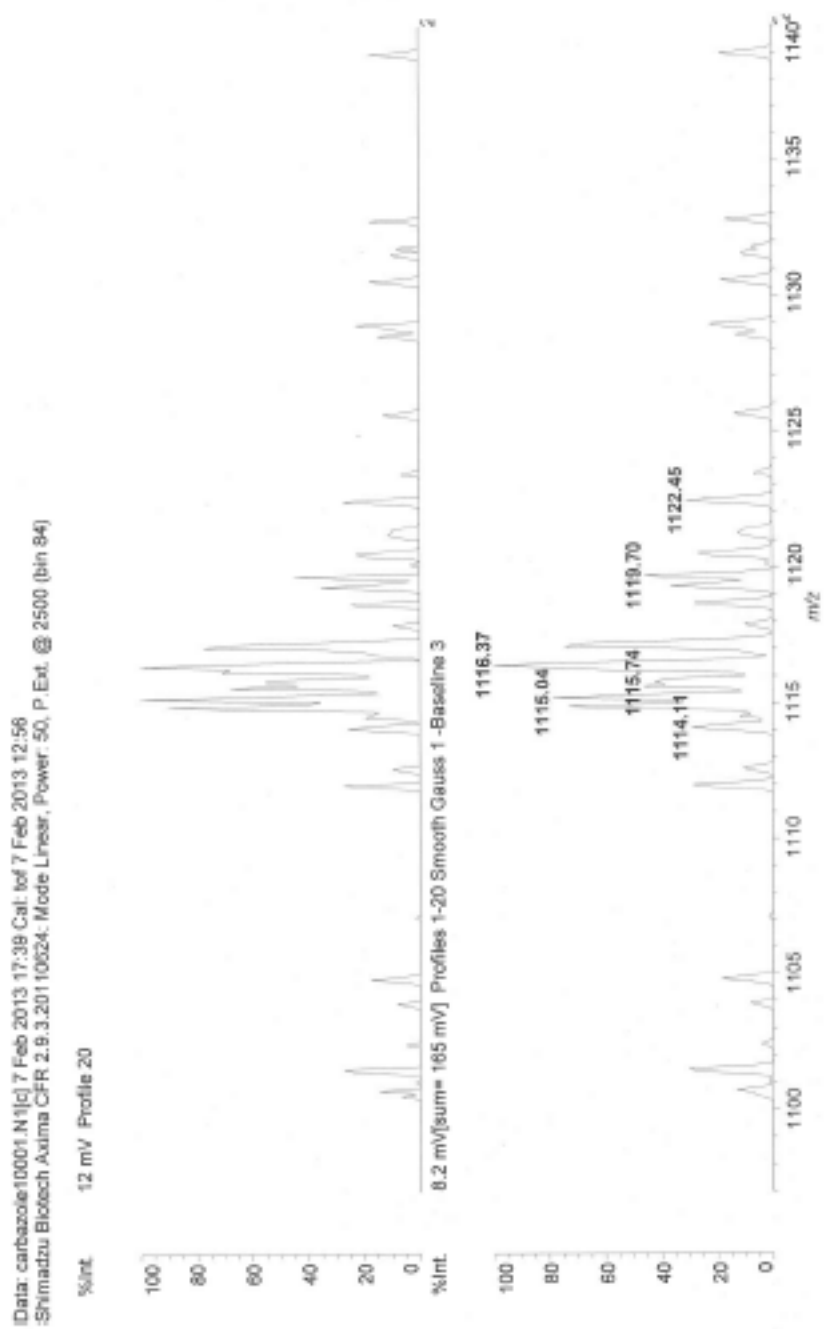


Figure S1. MALDI-TOF mass spectra of compound **1**.

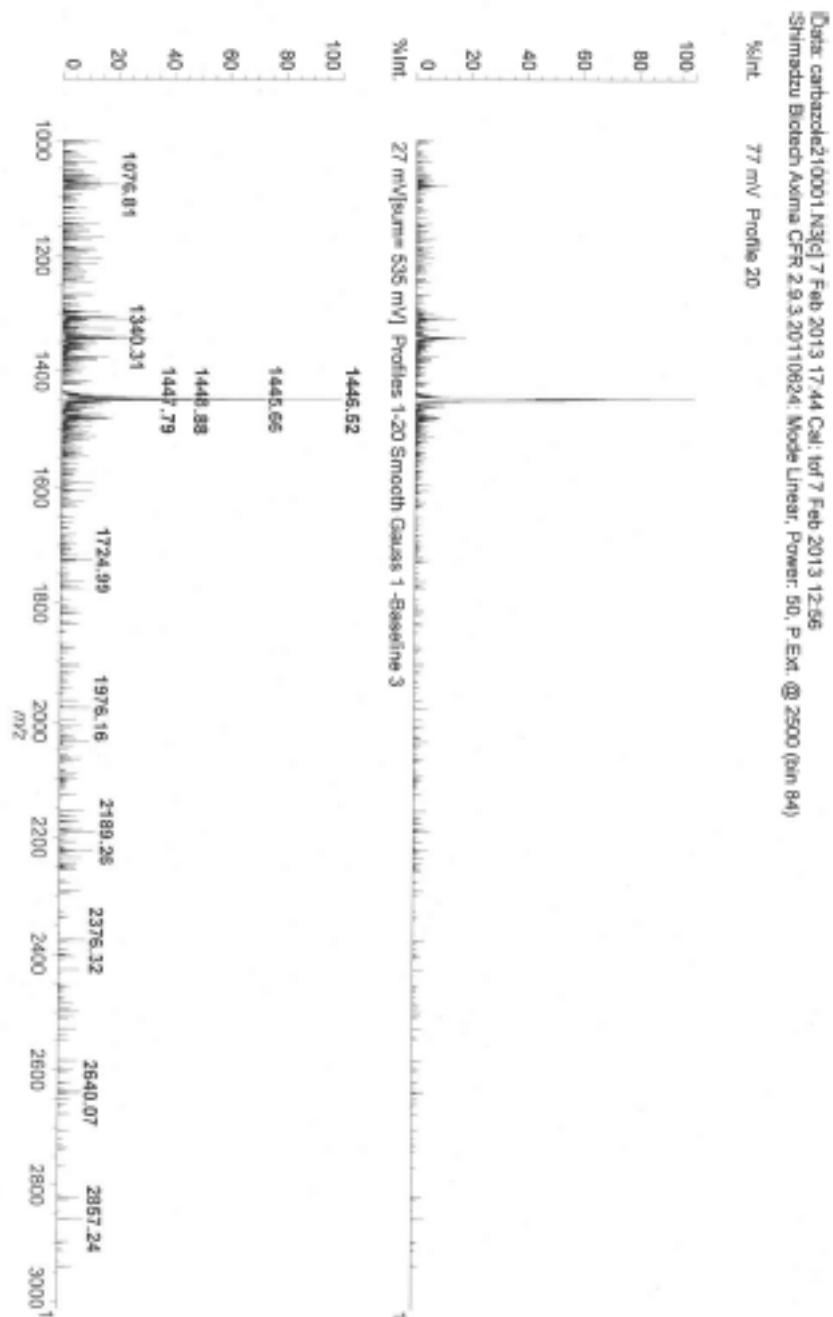


Figure S2. MALDI-TOF mass spectra of compound 2.

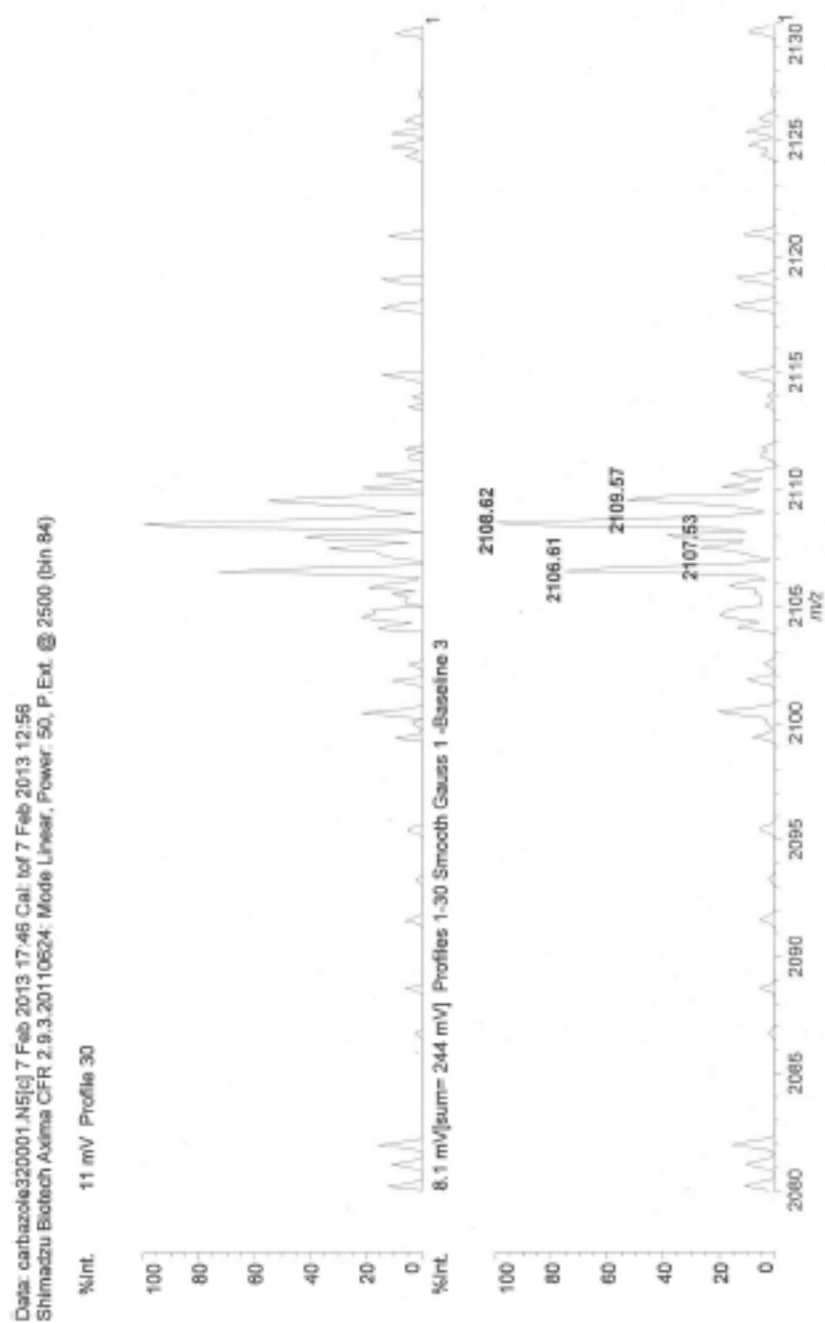


Figure S3. MALDI-TOF mass spectra of compound **3**.

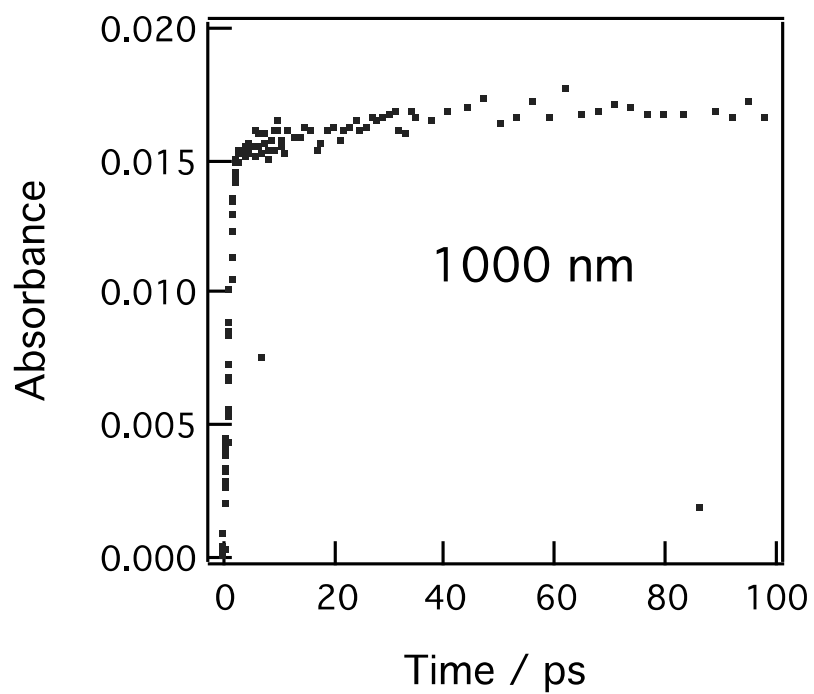


Figure S4. Rise profile of the C_{60}^- of **1** at 1000 nm shown in Figure 4, monitoring charge separation process.

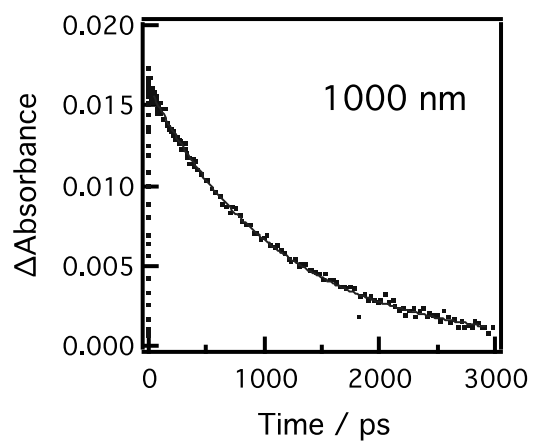


Figure S5. Decay profile of the C₆₀⁻ at 1000 nm of **2** in PhCN, monitoring charge separation from carbazole to the singlet C₆₀.

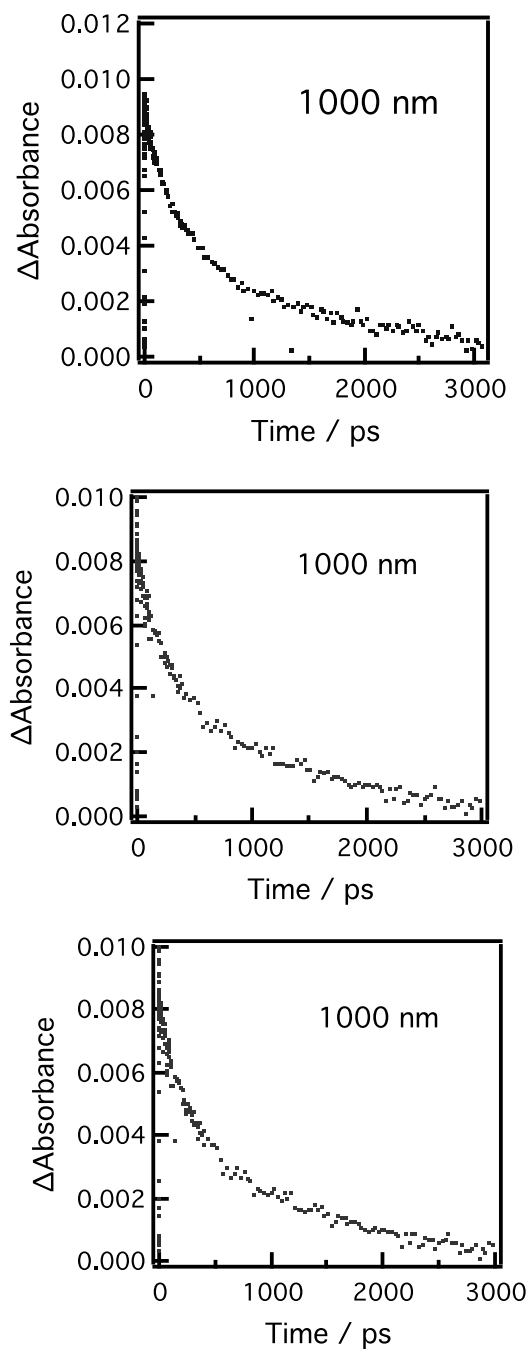


Figure S6. Decay Profiles of the C_{60} radical anion at 1000 nm of **1** (upper figure), **2** (middle figure), and **3** (lower figure) in deaerated DMF. The concentrations are kept at 1.0×10^{-4} M; $\lambda_{ex} = 390$ nm.

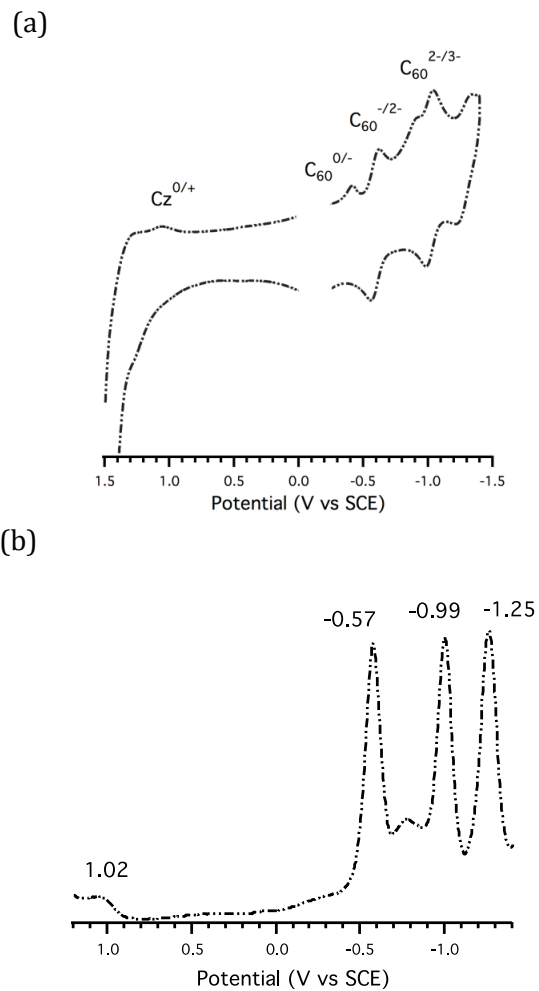


Figure S7. (a) CV and (b) DPV of **1** (1.0×10^{-4} M) in deaerated PhCN with TBAPF₆ (0.1 M) as support electrolyte in PhCN. Scan rate = 20 mV/s.

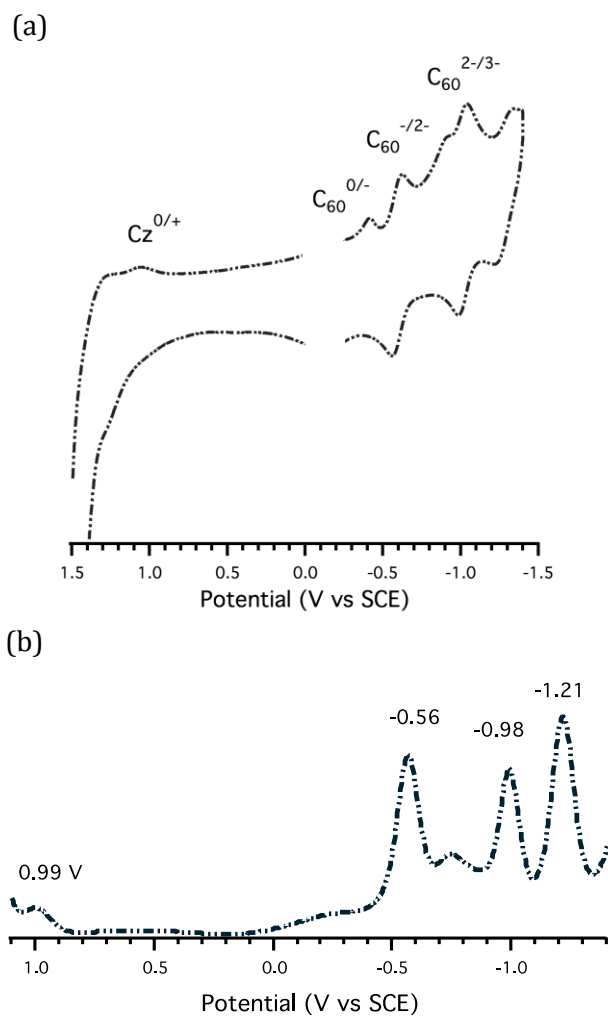


Figure S8. (a) CV and (b) DPV of **2** (1.0×10^{-4} M) in deaerated PhCN with TBAPF₆ (0.1 M) as support electrolyte in PhCN. Scan rate = 20 mV/s.

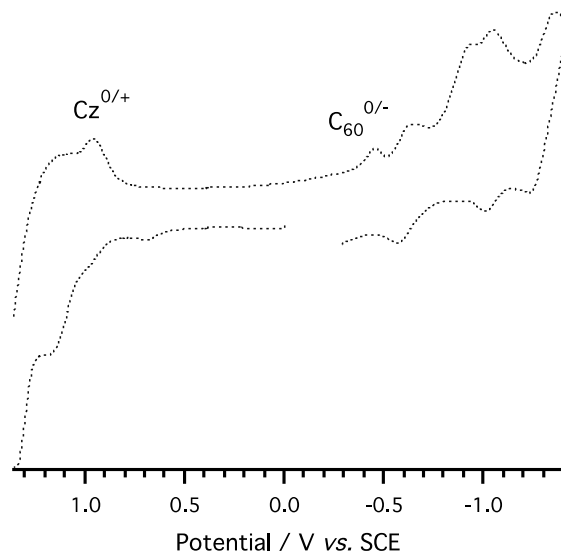


Figure S9. (a) CV and (b) DPV of **3** (1.0×10^{-4} M) in deaerated PhCN with TBAPF₆ (0.1 M) as support electrolyte in PhCN. Scan rate = 20 mV/s.

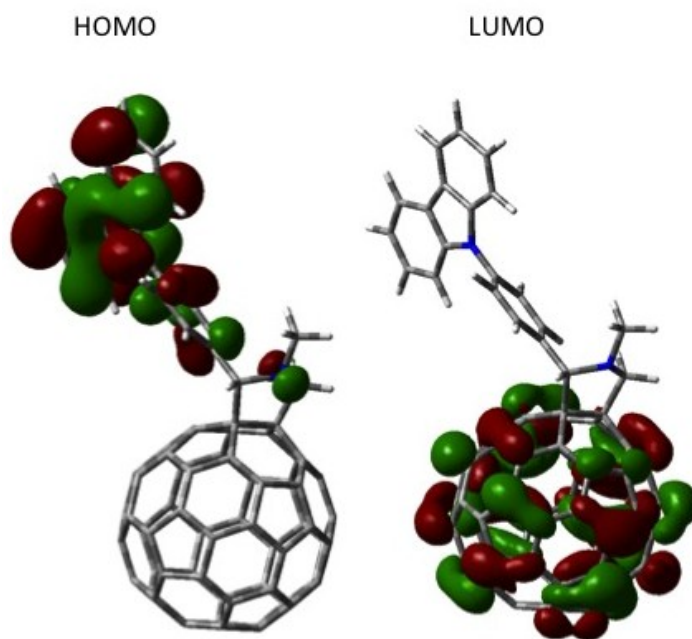


Figure S10. Optimized Frontier molecular orbitals of **1** obtained by using *ab initio* B3LYP/6-311G method.

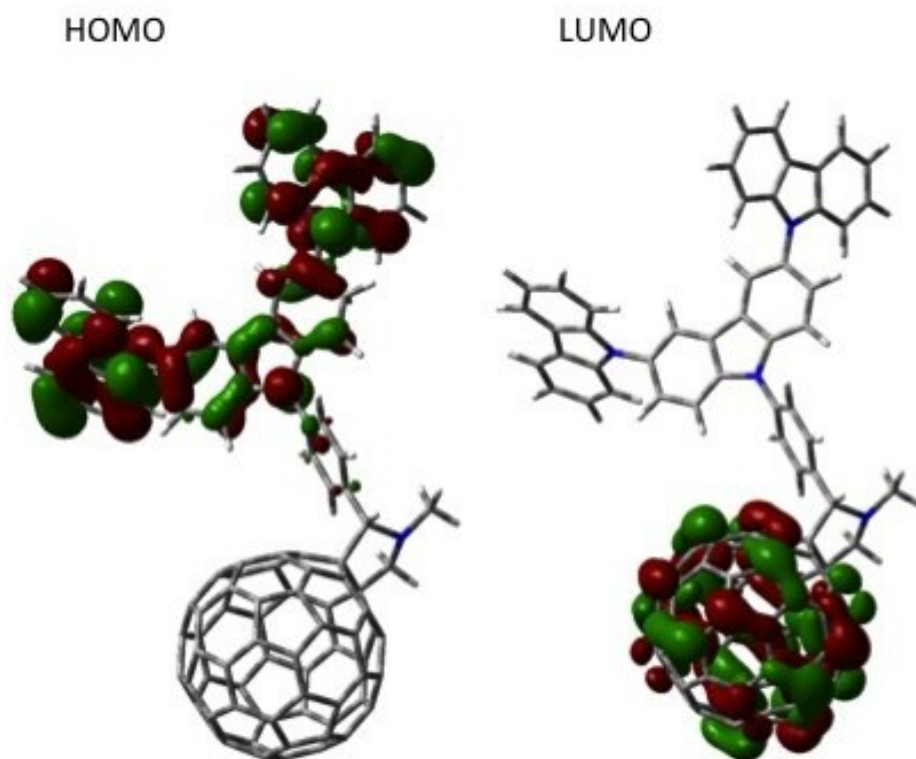


Figure S11. Optimized Frontier molecular orbital of **2** obtained by using *ab initio* B3LYP/6-311G method.

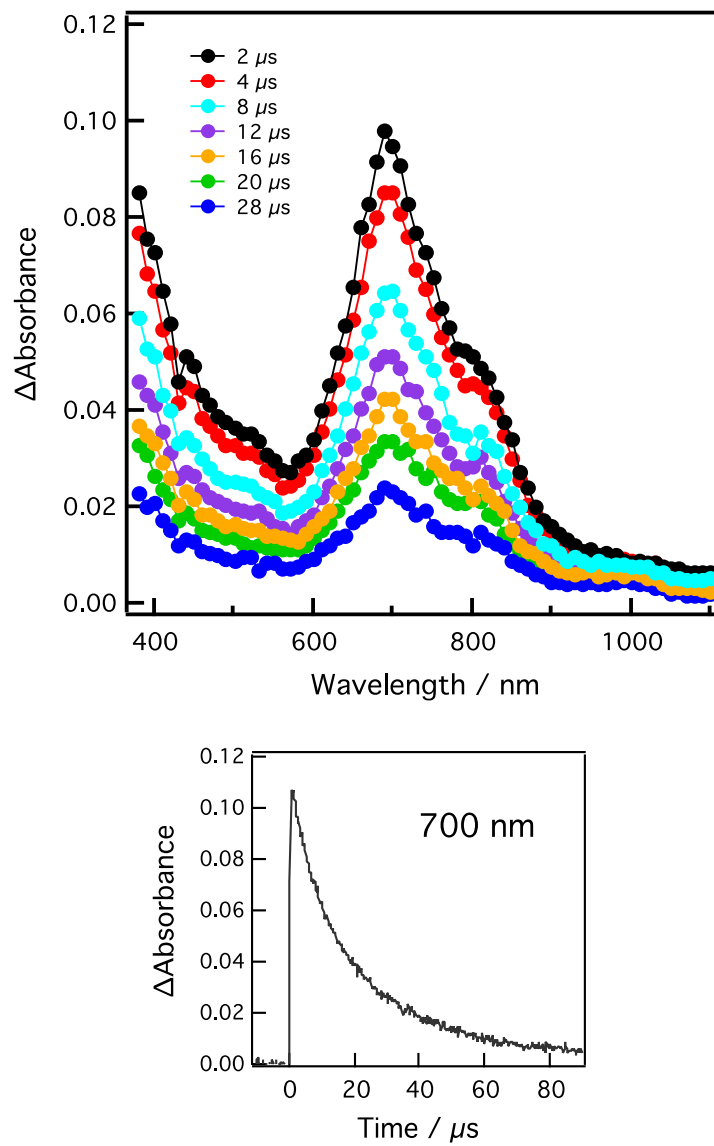


Figure S12. (Upper figure) Nanosecond transient absorption spectra of **1** (1.0×10^{-4} M) in deaerated PhCN; $\lambda_{\text{ex}} = 430$ nm. (Lower figure) Decay profile of $^3\text{C}_{60}^*$ at 700 nm.

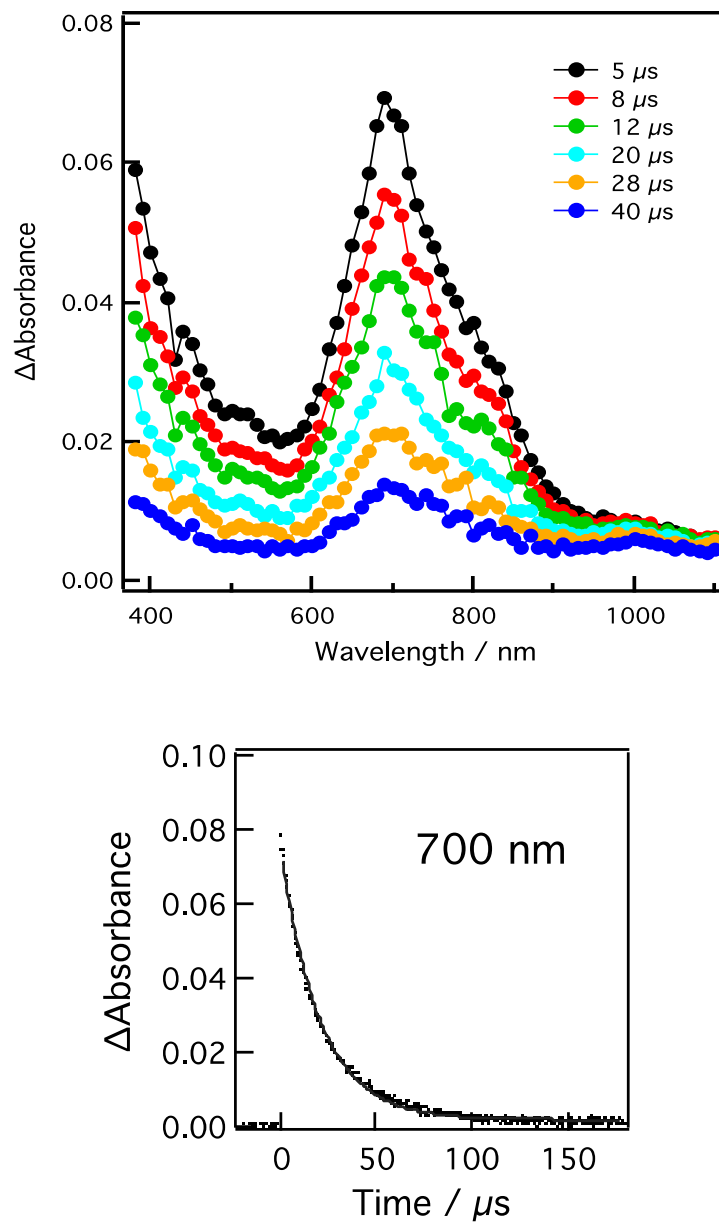


Figure S13. (Upper figure) Nanosecond transient absorption spectra of **2** (1.0×10^{-4} M) in deaerated PhCN; $\lambda_{\text{ex}} = 430$ nm. (Lower figure) Decay profile of $^3\text{C}_{60}^*$ at 700 nm.