Electronic Supplementary Information

Fullerene Modification of Gold Electrodes and Gold Nanoparticles Based on Application of Aromatic Thioacetate-Functionalized C_{60}

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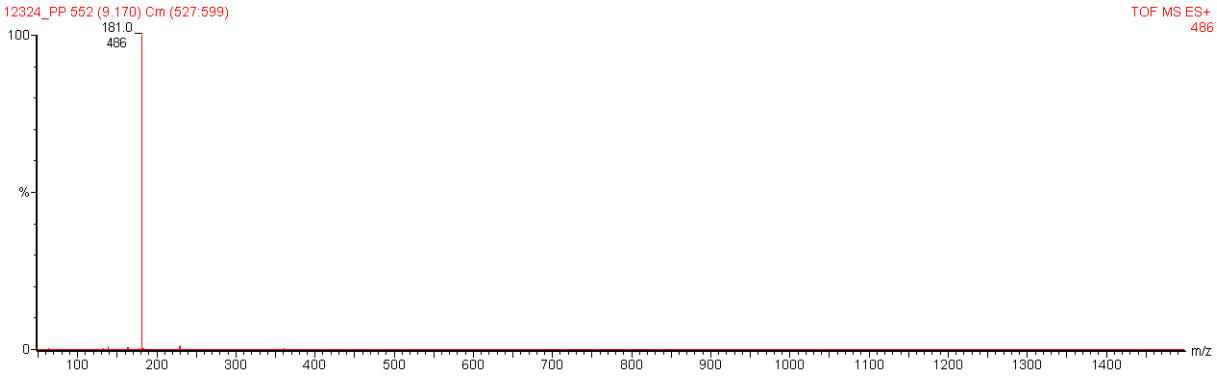

Figure S1. ESI-MS spectrum of 4-(*S*-acetylthio)benzaldehyde as a $[M + H]^+$ cation.

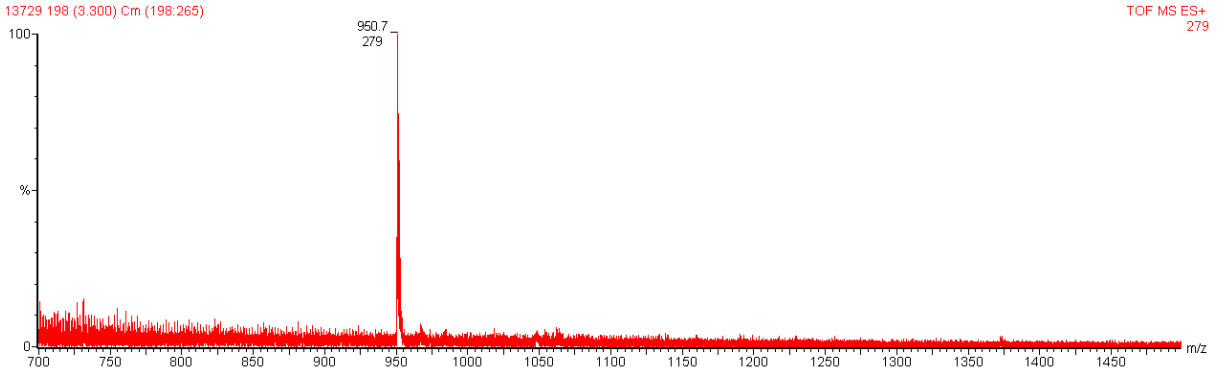

Figure S2. ESI-MS spectrum of aromatic thioacetate functionalized C_{60} fullerene (**ATF-C_{60}**) as a $[M+Na]^+$ cation.

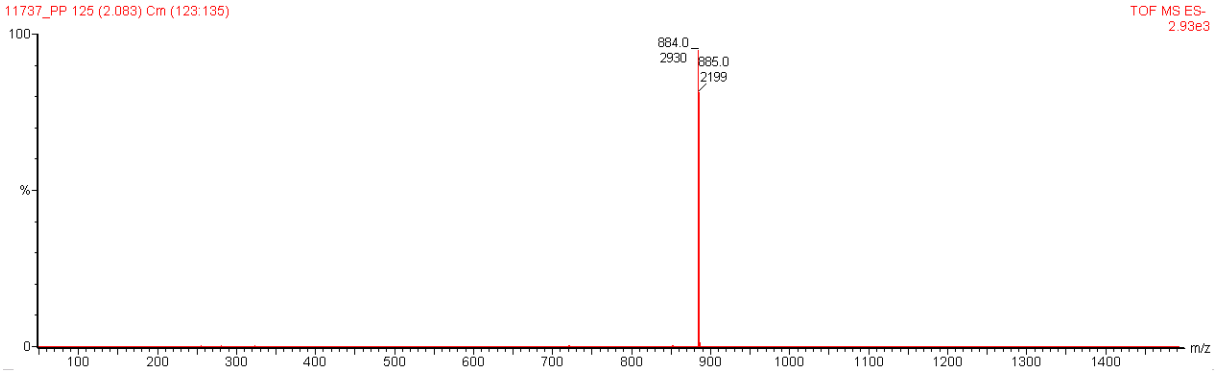

Figure S3. ESI-MS spectrum of thiolate anion of deprotected ATF-C_{60} as $[M-H]^-$.

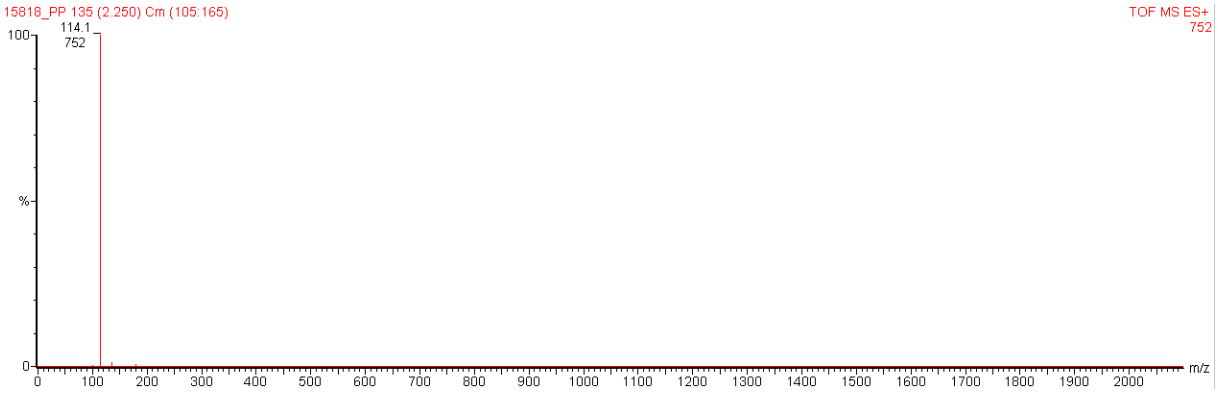

Figure S4. ESI-MS spectrum of *N*-acetylpyrrolidine present in methanol washings as $[M + H]^+$ cation.

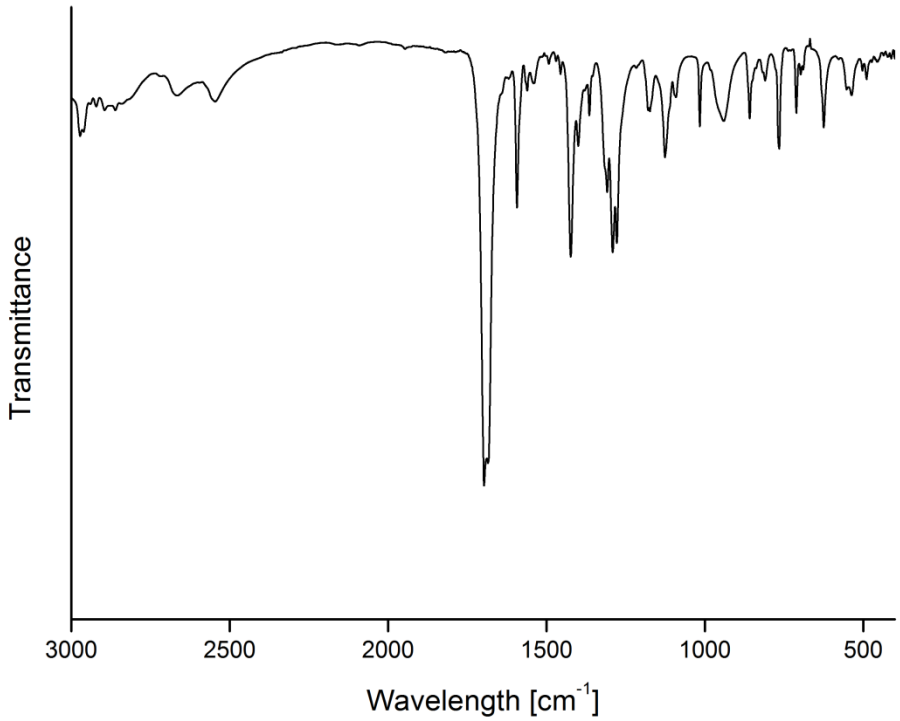

Figure S5. IR spectrum of 4-(*S*-acetylthio)benzaldehyde in KBr disk.

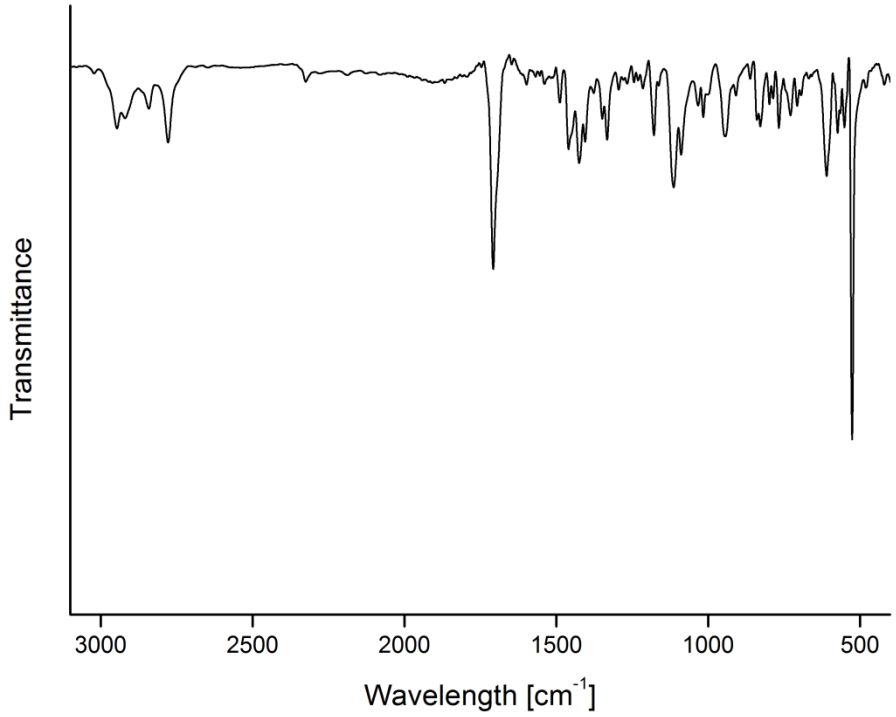

Figure S6. IR spectrum of aromatic thioacetate functionalized C_{60} fullerene (**ATF-C_{60}**) in KBr disk.

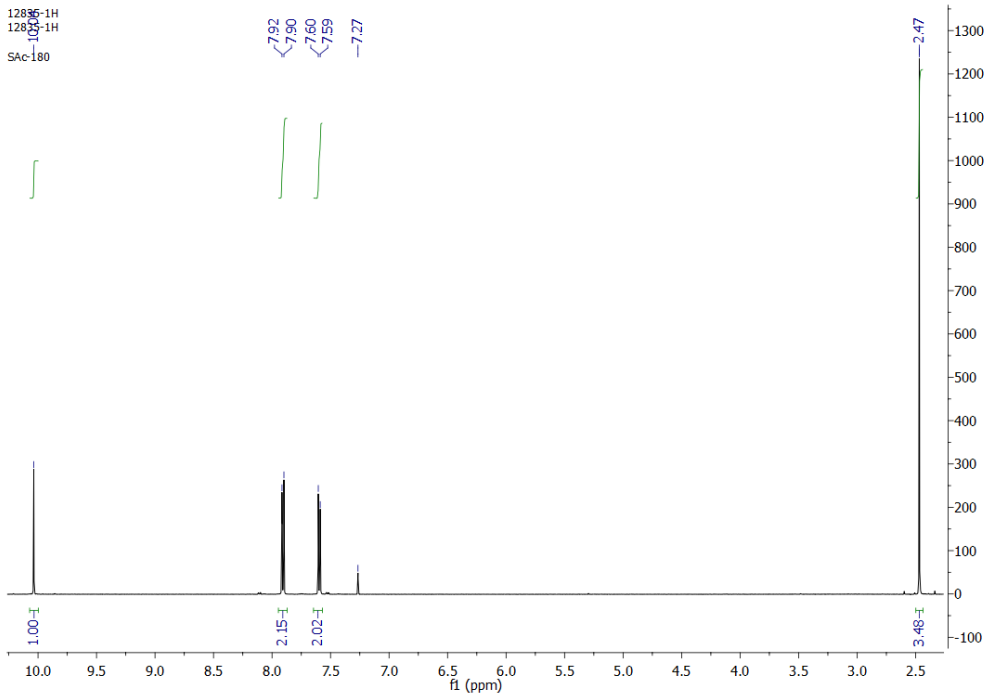

Figure S7. ^{1}H NMR spectrum of 4-(*S*-acetylthio)benzaldehyde in $CDCl_3$.

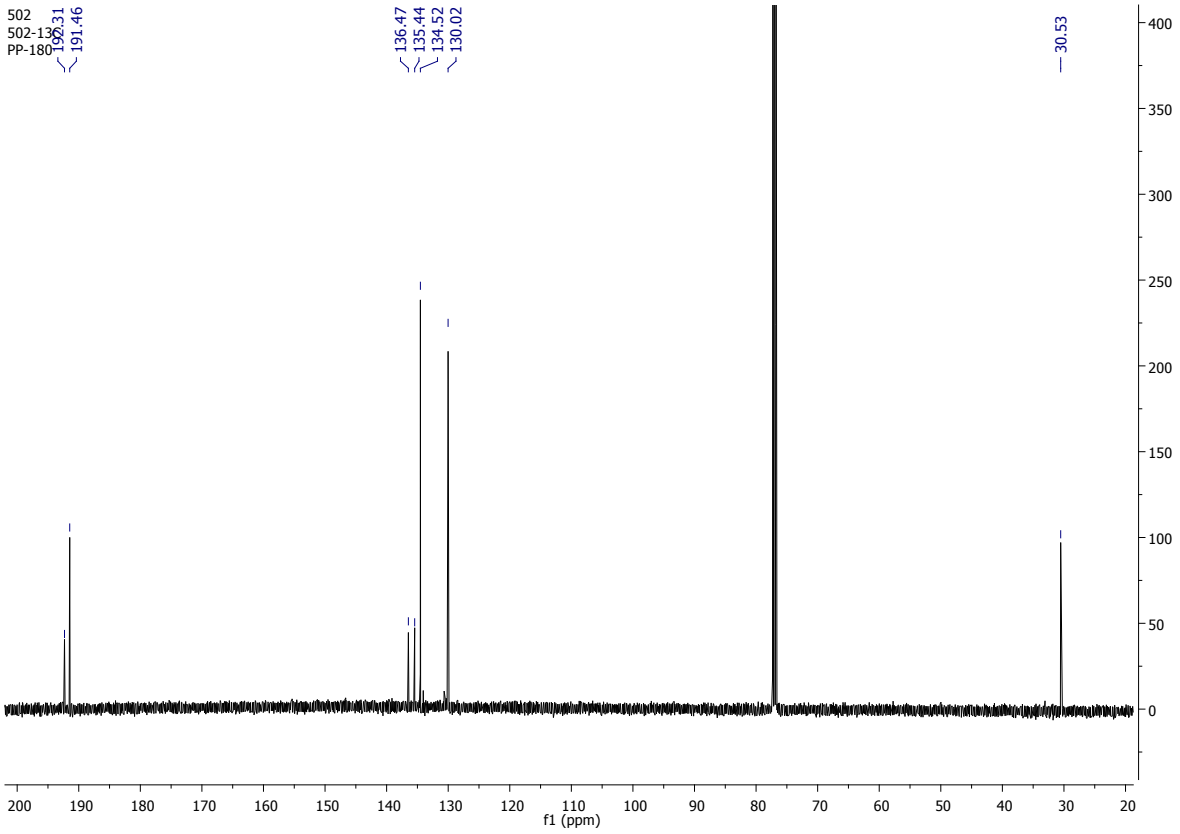

Figure S8. ^{13}C NMR spectrum of 4-(*S*-acetylthio)benzaldehyde in $CDCl_3$.

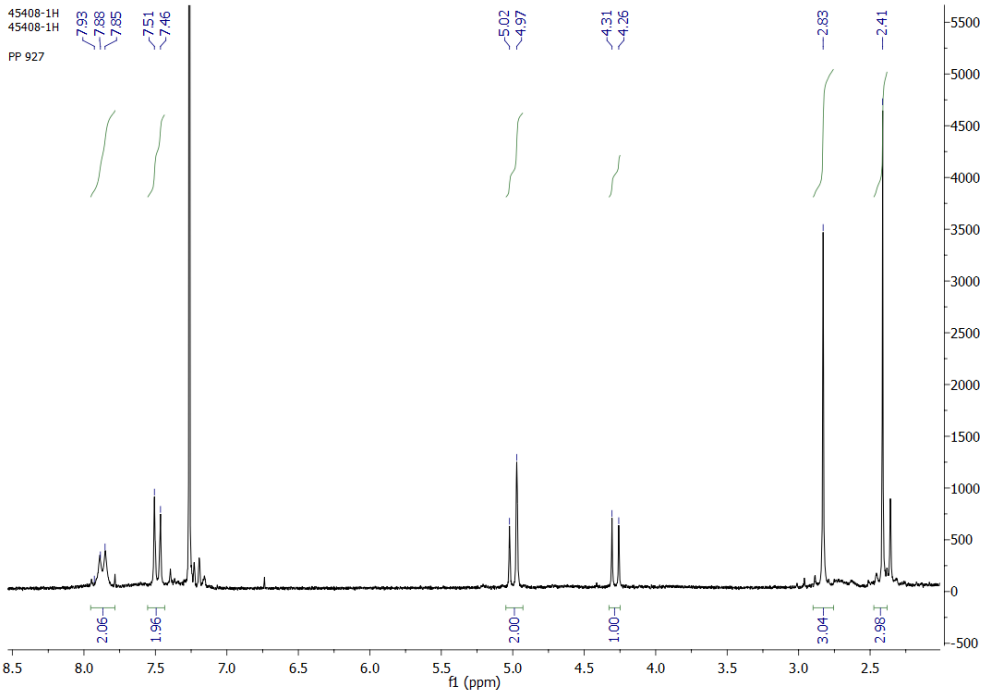

Figure S9. ^{1}H NMR spectrum of aromatic thioacetate functionalized C_{60} fullerene (**ATF-C_{60}**) in $CDCl_3$.

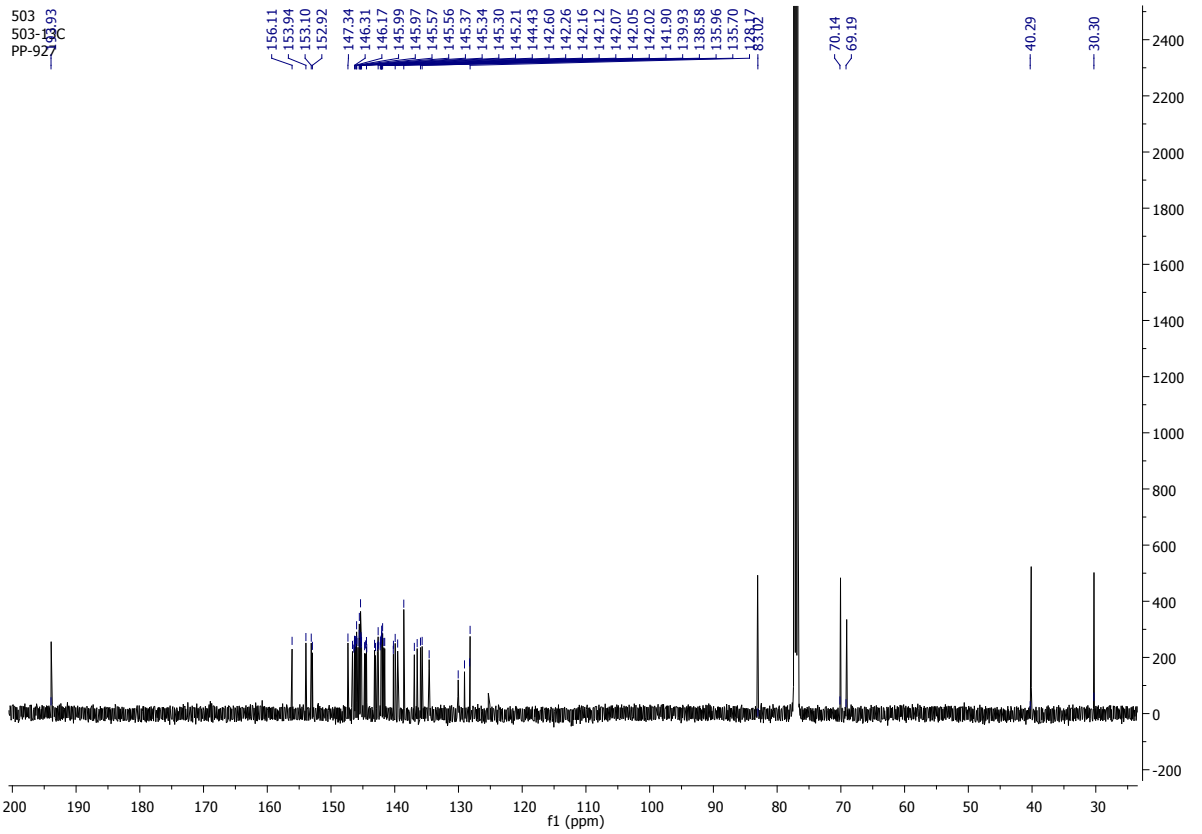

Figure S10. ^{13}C NMR spectrum of aromatic thioacetate functionalized C_{60} fullerene (**ATF-C_{60}**) in $CDCl_3$.

	Size (d.nm):	% Volume:	St Dev (d.nm):
Peak 1:	4.716	100.0	1.210
Peak 2:	0.000	0.0	0.000
Peak 3:	0.000	0.0	0.000

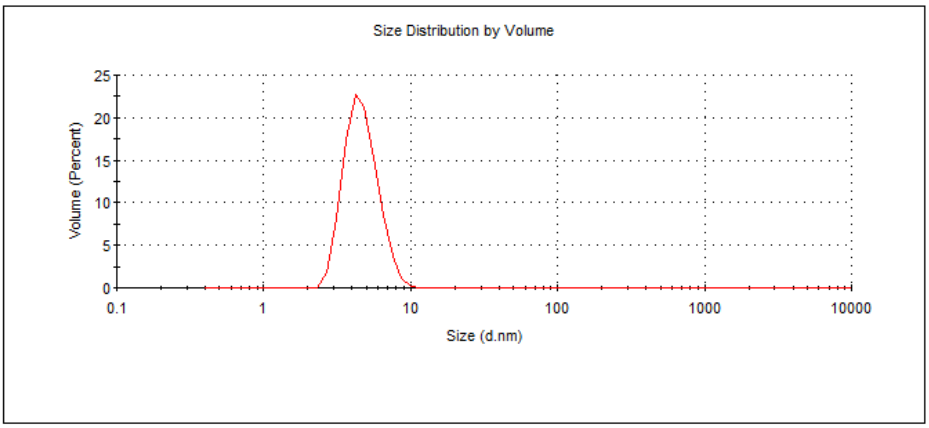

Figure S11. Size distribution of synthesized bare octanethiol-AuNPs obtained from Dynamic Light Scattering measurement.

	Size (d.nm):	% Volume:	St Dev (d.nm):
Peak 1:	301.2	0.2	62.91
Peak 2:	7.268	99.7	1.058
Peak 3:	106.9	0.1	19.67

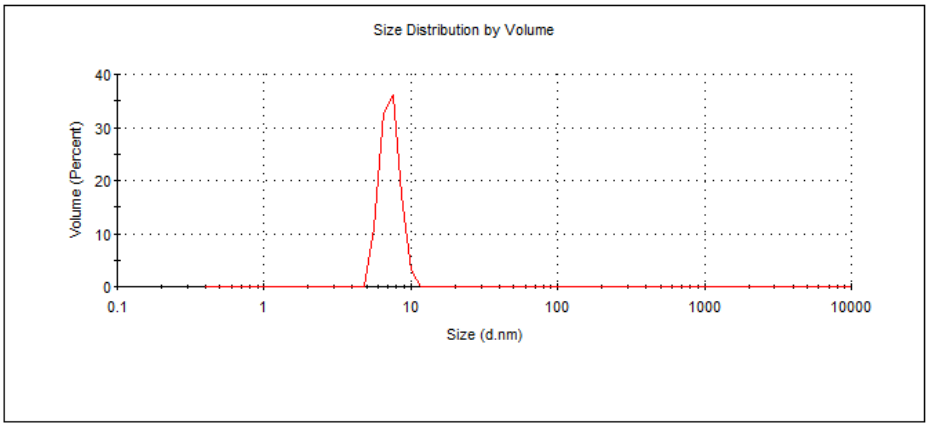

Figure S12. Size distribution of AuNPs coated with fullerene derivative (**ATF-C_{60}@AuNPs)** obtained from Dynamic Light Scattering measurement.

Table S1. Comparison of electrochemical properties of C_{60} and **ATF-C_{60}** CV and DPV (bottom)

Compound	C_{60}	ATF-C_{60}
E_{pc1} [V]	-0.467	-0.599
E_{pa1} [V]	-0.396	-0.522
$E_1^{0'}$ [V]	-0.432	-0.561
E_{pc2} [V]	-0.874	-0.951
E_{pa2} [V]	-0.807	-0.836
$E_2^{0'}$ [V]	-0.841	-0.894
E_{pc3} [V]	-1.40	-1.592
E_{pa3} [V]	-1.324	-1.573
$E_3^{0'}$ [V]	-1.362	-1.583
E_{pc4} [V]	-1.895	-2.099
E_{pa4} [V]	-1.828	-2.016
$E_4^{0'}$ [V]	-1.862	-2.013
E_{pc5} [V]	-2.417	a)
E_{pa5} [V]	-2.274	a)
$E_5^{0'}$ [V]	-2.346	a)

Compound	C_{60}	ATF-C_{60}
$i_{c1}c^{-1}$[Amol^{-1}dm^3]	$1.57\cdot10^{-2}$	$8.49\cdot10^{-3}$
$i_{a1}c^{-1}$[Amol^{-1}dm^3]	$1.14\cdot10^{-2}$	$7.62\cdot10^{-3}$
$i_{a1}c^{-1}$/ $i_{c1}c^{-1}$	0.73	0.90
$i_{c2}c^{-1}$[Amol^{-1}dm^3]	$1.29\cdot10^{-2}$	$6.81\cdot10^{-3}$
$i_{a2}c^{-1}$[Amol^{-1}dm^3]	$1.21\cdot10^{-2}$	$6.7\cdot10^{-3}$
$i_{a2}c^{-1}$/ $i_{c2}c^{-1}$	0.94	0.973
$i_{c3}c^{-1}$[Amol^{-1}dm^3]	$1.29\cdot10^{-2}$	$5.47\cdot10^{-3}$
$i_{a3}c^{-1}$[Amol^{-1}dm^3]	$1.21\cdot10^{-2}$	$6.86\cdot10^{-3}$
$i_{a3}c^{-1}$/ $i_{c3}c^{-1}$	0.94	0.79
$i_{c4}c^{-1}$[Amol^{-1}dm^3]	$1.36\cdot10^{-2}$	$5.54\cdot10^{-3}$
$i_{a4}c^{-1}$[Amol^{-1}dm^3]	$1\cdot10^{-2}$	$1.14\cdot10^{-2}$
$i_{a4}c^{-1}$/ $i_{c4}c^{-1}$	0.74	0.526

a) Peak corresponding to step 5 could not be resolved due to final rise of current

Compound	C_{60}	ATF-C_{60}
E_1 [V]	-0.422	-0.559
$_{b1/2}$ [mV]	103	107
E_2 [V]	-0.827	-0.974
$_{b1/2}$ [mV]	98	107
E_3 [V]	-1.342	-1.550
$_{b1/2}$ [mV]	98	103
E_4[V]	-1.845	-2.063
$_{b1/2}$ [mV]	98	107
E_5 [V]	-2.338	-
$_{b1/2}$ [mV]	88	-
E_6 [V]	-2.656	-
$_{b1/2}$ [mV]	44	-