

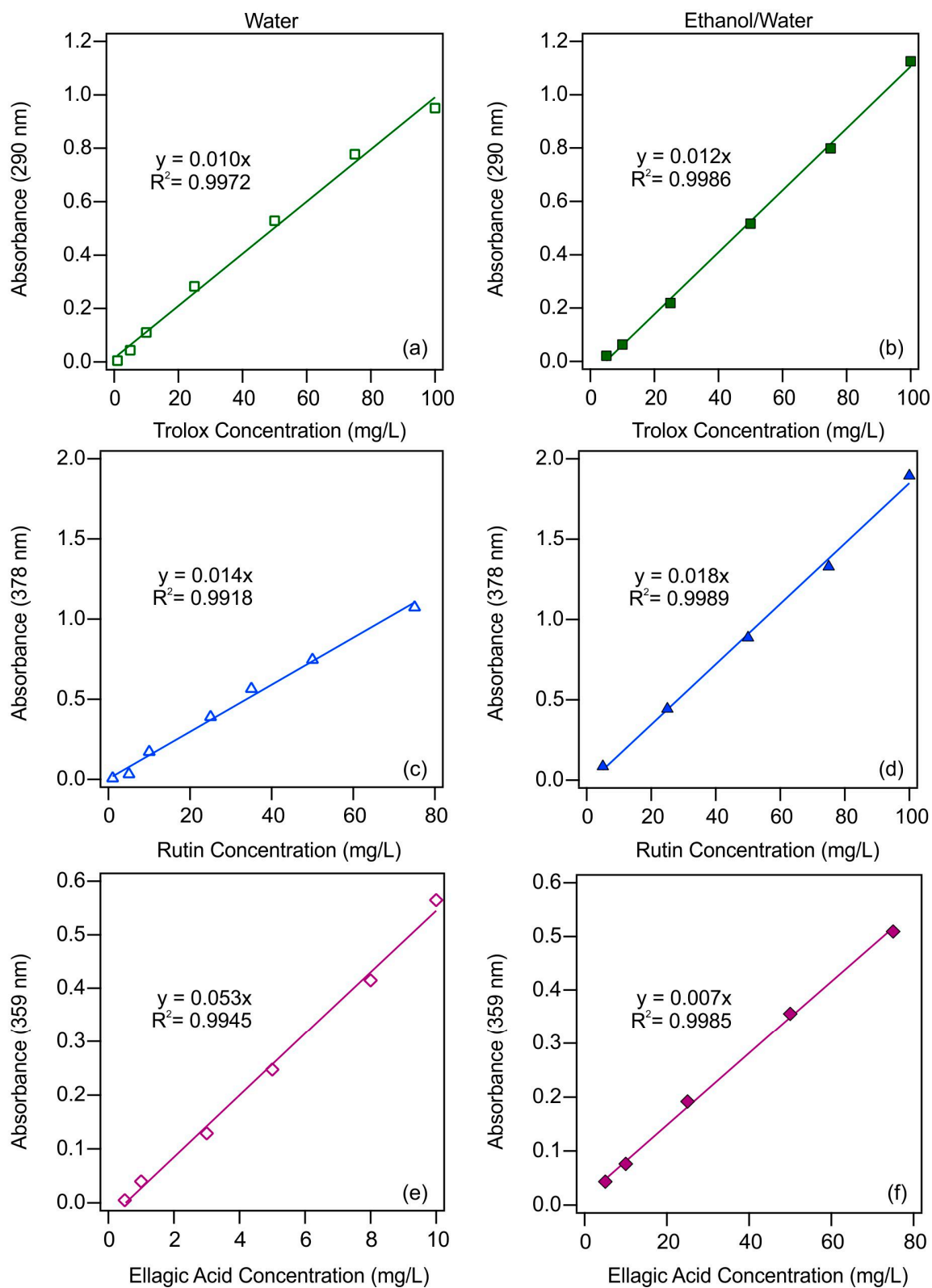
## **Supplementary Materials (SM)**

### **The Influence of Solvents and Colloidal Particles on the Efficiency of Molecular Antioxidants**

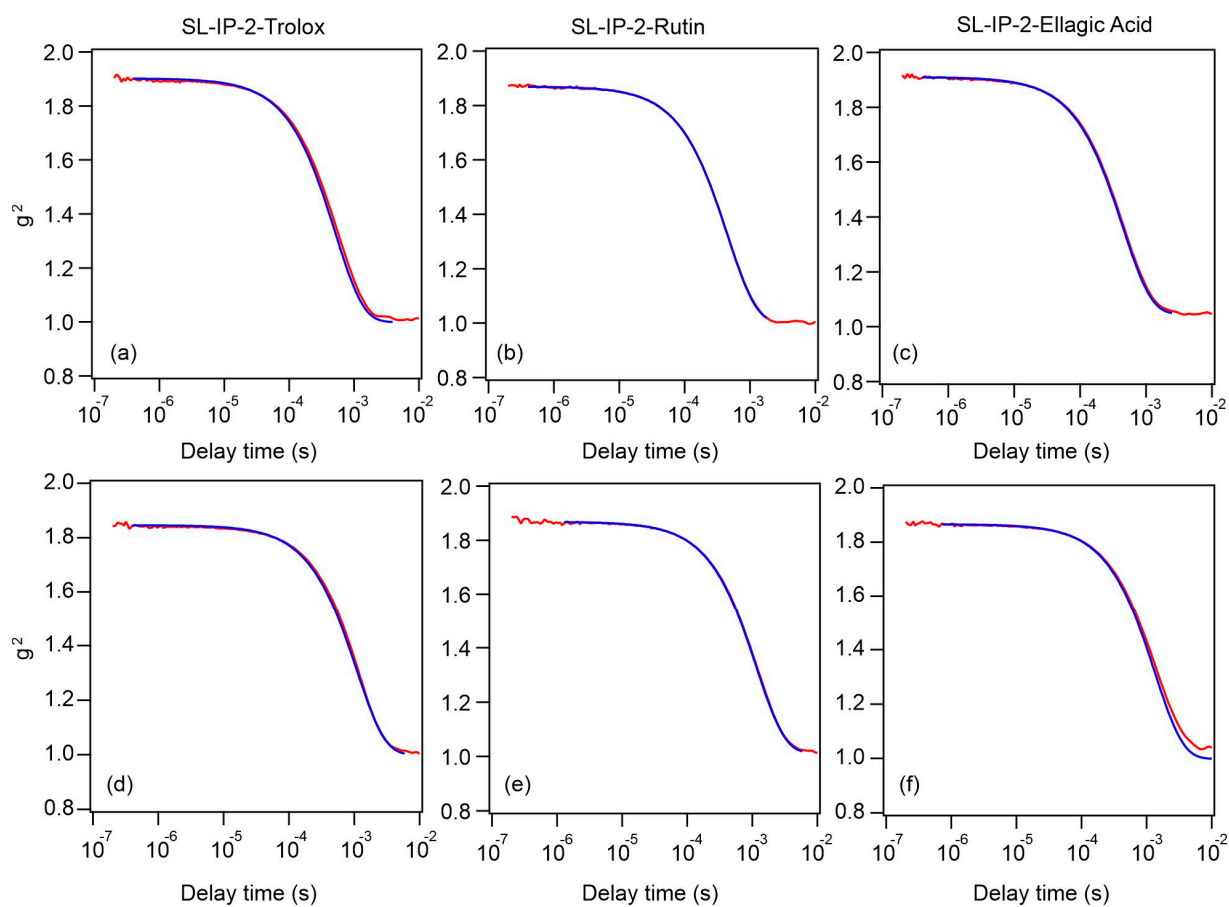
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**Figure S1.** Calibration curves for antioxidants in water (left column) and in ethanol/water (right column) obtained at the wavelength corresponding to the absorption maxima determined for each antioxidant.



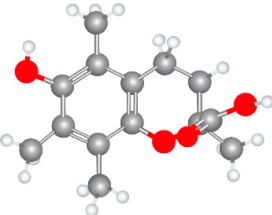
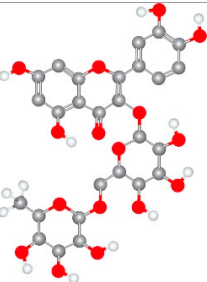
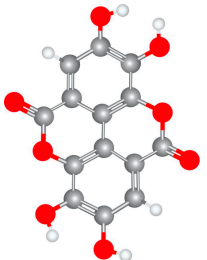
**Figure S2.** Intensity correlation function ( $g^2$ ) versus the delay time for SL-IP-2-Trolox, SL-IP-2-Rutin, and SL-IP-2-Ellagic acid systems in water (a-c), and in ethanol/water (d-f). The antioxidant dose in all systems was maintained at 100 mg/g. The red solid line refers to the correlation function, and blue solid line represents the Cumulant fit.

**Table S1.** Characteristic size and charge data of the bare SL particles and SL-IP-2 in water.

Compound	$R_h^a$ (nm)	$EM^a$ ( $10^{-8}$ m <sup>2</sup> /Vs)	$PDI^a$ (%)	IP-2 dose <sup>b</sup> (mg/g)
SL	137	-3.96	7.3	-
SL-IP-2	143	1.87	10.2	300

<sup>a</sup>Hydrodynamic radius ( $R_h$ ), electrophoretic mobility (EM), and polydispersity index (PDI) were measured by light scattering at 1 mM ionic strength. The average errors of the measurements are  $\pm 6$  nm and  $\pm 3.2\%$  for the  $R_h$  and PDI, respectively, while for the electrophoretic mobilities the average error is about 10%. <sup>b</sup>IP-2 dose refers to the polymer concentration in terms of mg of IP-2 per 1 g of SL.

**Table S2.** The hydrodynamic radius ( $R_h$ ), polydispersity index (PDI), and electrophoretic mobility (EM) data of SL-IP-2 with 100 mg/g dose of antioxidants. Effective concentrations and minimum DPPH% values are also presented.

System	SL-IP-2-Trolox		SL-IP-2-Rutin		SL-IP-2-Ellagic Acid	
Antioxidant structure						
solvent	H <sub>2</sub> O	EtOH/H <sub>2</sub> O	H <sub>2</sub> O	EtOH/H <sub>2</sub> O	H <sub>2</sub> O	EtOH/H <sub>2</sub> O
<sup>a</sup> $R_h$ (nm)	147	431	142	426	142	476
<sup>a</sup> $PDI$ (%)	6.88	12.11	7.64	14.70	13.87	18.78
<sup>b</sup> $EM$ ( $10^{-8}$ m <sup>2</sup> V <sup>-1</sup> ·s <sup>-1</sup> )	0.42	1.53	0.48	1.51	0.59	1.43
<sup>c</sup> $EC_{50}$ (mg/L)	-	3.0	-	21.2	-	0.9
minimum DPPH%	54.8	0.3	60.1	47.3	89.6	5.4

<sup>a</sup>Hydrodynamic radius ( $R_h$ ) and polydispersity index (PDI) values were determined by DLS. The measurement errors are  $\pm 7$  nm, and  $\pm 2.50\%$  for  $R_h$  and PDI, respectively. <sup>b</sup>Electrophoretic mobility (EM) was measured by light scattering in 1 mM KCl concentration with an average error of 10%. <sup>c</sup>The effective concentration ( $EC_{50}$ ) values were determined in the DPPH assay with an average error of 5%.