Electronic Supplementary Material (ESI) for RSC Advances.

Table S1 Ethylene glycol solubilities in supercritical CO_2 at 353.15 K[a]

T (K)	P (MPa)	Ethylene glycol solubility (y_2, 10^{-2} mol/mol)	
		Test data	Jiang's data[b]
353.15	11	1.09	1.2
	13	1.32	1.46
	15	1.95	1.90
	17	3.03	3.16
	19	4.40	4.29

[a] Standard uncertainties u are u(T) = 0.1 K and u(P) = 0.1 MPa; u(y_2) = 0.02 mol/mol with 0.95 level of confidence (k≈2).

[b] Observed by Jiang et al..[28]

Table S2 Solubilities of water in supercritical CO_2[a]

T	P	SC-CO_2 Density[b]	Water	
(K)	(MPa)	(kg/m^3)	Solubility (y_2, 10^{-3} mol/mol)	Concentration (S, g/l)
353.15	20	593.89	17.52	4.39
	22	636.74	17.76	4.65
	24	671.27	18.74	5.24
	26	699.95	19.69	5.64
363.15	20	533.17	19.28	4.40
	22	580.38	20.19	4.67
	24	619.21	21.01	5.68
	26	651.66	21.93	5.72
373.15	20	480.53	24.07	4.85
	22	528.94	24.83	5.59
	24	570.19	25.20	5.94
	26	605.34	27.20	6.92
393.15	20	401.15	31.56	5.35
	22	445.86	34.55	6.53
	24	486.70	35.06	7.23
	26	523.39	35.78	7.95
413.15	20	347.58	44.01	6.76
	22	386.61	45.38	7.28
	24	423.72	47.20	8.21
	26	458.44	50.43	9.96

[a] Standard uncertainties u are u(T) = 0.1 K, u(P) = 0.1 MPa and u(ρ) = 0.1 kg/m^3; u(y_2) = 0.02 mol/mol and u(S) = 0.02 g/l with 0.95 level of confidence (k≈2).

[b] The density of supercritical CO_2 is obtained from the NIST fluid property database.[29]

Table S3 Solubilities of Acid Red 138 in supercritical CO_2 saturated with water[a]

T (K)	P (MPa)	SC-CO_2 Density[b] (kg/m^3)	Dyes in SC-CO_2		Dyes in liquid phase	
			Solubility (y_2, 10^{-6}mol/mol)	Concentration (S, 10^{-3} g/l)	Dyes (S, 10^{-3} g/l)	Water (S, 10^{-1} g/l)
353.15	20	593.89	4.77	4.32	1.91	1.12
	22	636.74	5.01	4.86	1.90	1.07
	24	671.27	5.70	5.83	1.88	0.95
	26	699.95	6.21	6.63	1.87	0.87
363.15	20	533.17	5.53	4.50	1.91	1.12
	22	580.38	5.81	5.14	1.89	1.01
	24	619.21	6.22	5.87	1.88	0.86
	26	651.66	6.87	6.83	1.86	0.85
373.15	20	480.53	7.26	5.32	1.89	1.03
	22	528.94	7.64	6.16	1.88	0.88
	24	570.19	8.11	7.05	1.86	0.81
	26	605.34	8.81	8.13	1.84	0.61
393.15	20	401.15	10.63	6.50	1.87	0.93
	22	445.86	10.65	7.24	1.86	0.69
	24	486.70	10.86	8.06	1.84	0.55
	26	523.39	11.04	8.81	1.83	0.41
413.15	20	347.58	13.30	7.05	1.86	0.65
	22	386.61	13.96	8.23	1.84	0.54
	24	423.72	14.05	9.08	1.82	0.36
	26	458.44	14.09	9.85	1.80	0.008

[a] Standard uncertainties u are u(T) = 0.1 K, u(P) = 0.1 MPa and u(ρ) = 0.1 kg/m^3; u(y_2) = 0.02 mol/mol and u(S) = 0.02 g/l with 0.95 level of confidence (k≈2).

[b] The density of supercritical CO_2 is obtained from the NIST fluid property database.[29]