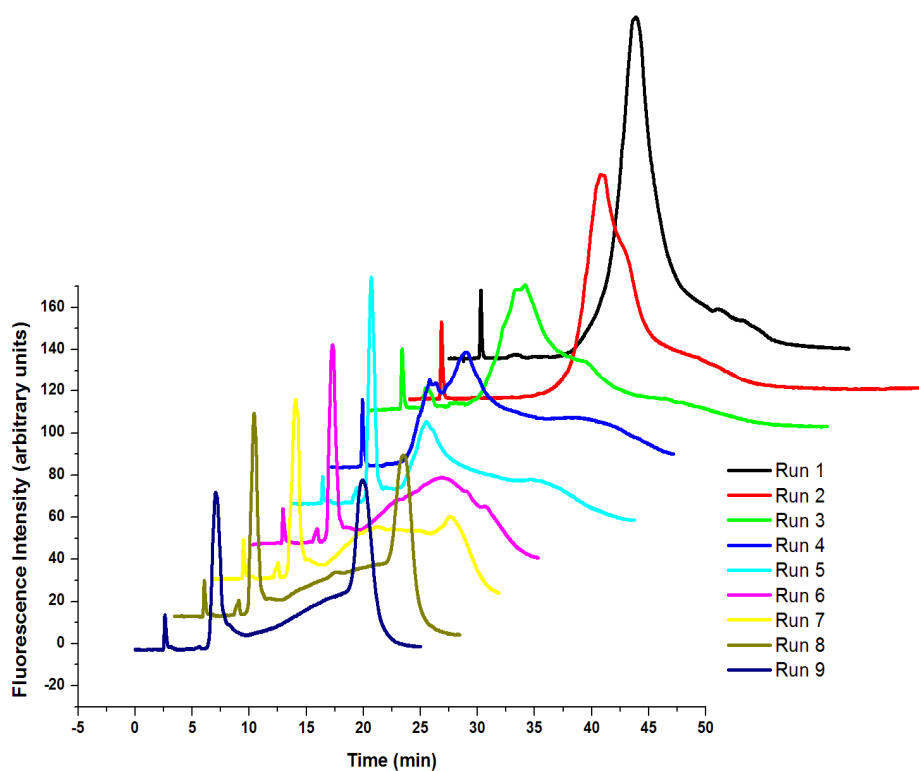


**Table S1:** Data obtained during gradient development (chromatograms shown in Figure S1) for the separation of 0.02 g L<sup>-1</sup> asphaltenes. Tetrahydrofuran (THF), acetonitrile (MeCN), N-methyl-2-pyrrolidinone (NMP).

Solvent Composition	Run 1							Solvent Composition	Run 6							
	Time (min)	0	2.5	9	19	30	35		Time (min)	0	5	10	15	25		
	THF	0.0%	0.0%	30%	50%	51%	50%		THF	0.0%	25%	45%	50%	40%		
	NMP	0.0%	0.0%	20%	40%	47%	50%		NMP	0.0%	0.0%	10%	50%	60%		
	MeCN	40%	50%	30%	5%	1.0%	0.0%		MeCN	75%	60%	40%	0.0%	0.0%		
	H <sub>2</sub> O	60%	50%	20%	5%	1.0%	0.0%		H <sub>2</sub> O	25%	15%	5.0%	0.0%	0.0%		
	P'	8.44	8.00	6.32	5.48	5.35	5.35		P'	6.90	6.01	5.30	5.35	5.62		
Solvent Composition	Run 2							Solvent Composition	Run 7							
	Time (min)	0	2.5	10	20	30	45		Time (min)	0	5	10	12.5	25		
	THF	0.0%	0.0%	40%	50%	51%	50%		THF	0.0%	10%	40%	80%	80%		
	NMP	0.0%	0.0%	10%	40%	47%	50%		NMP	0.0%	15%	20%	20%	20%		
	MeCN	40%	50%	30%	5.0%	1.0%	0.0%		MeCN	75%	60%	30%	0.0%	0.0%		
	H <sub>2</sub> O	60%	50%	20%	5.0%	1.0%	0.0%		H <sub>2</sub> O	25%	15%	10%	0.0%	0.0%		
	P'	8.44	8.00	6.05	5.48	5.35	5.35		P'	6.90	6.42	5.70	4.54	4.54		
Solvent Composition	Run 3							Solvent Composition	Run 8							
	Time (min)	0	2.5	10	25	30	40		Time (min)	0	5	10	12.5	25		
	THF	0.0%	10%	40%	50%	49%	50%		THF	0.0%	5.0%	20%	60%	80%		
	NMP	0.0%	10%	10%	46%	49%	50%		NMP	0.0%	20%	30%	40%	20%		
	MeCN	55%	45%	30%	2.0%	1.0%	0.0%		MeCN	75%	60%	40%	0.0%	0.0%		
	H <sub>2</sub> O	45%	35%	20%	2.0%	1.0%	0.0%		H <sub>2</sub> O	25%	15%	10%	0.0%	0.0%		
	P'	7.78	7.25	6.05	5.40	5.40	5.35		P'	6.90	6.55	6.15	5.08	4.54		
Solvent Composition	Run 4							Solvent Composition	Run 9							
	Time (min)	0	2.5	10	20	25	30		Time (min)	0	5	10	12.5	15	25	30
	THF	0.0%	25%	40%	47%	49%	50%		THF	0.0%	5.0%	20%	70%	80%	90%	90%
	NMP	0.0%	0.0%	10%	47%	49%	50%		NMP	0.0%	20%	30%	30%	20%	10%	10%
	MeCN	70%	55%	35%	3.0%	1.0%	0.0%		MeCN	75%	60%	40%	0.0%	0.0%	0.0%	0.0%
	H <sub>2</sub> O	30%	20%	15%	3.0%	1.0%	0.0%		H <sub>2</sub> O	25%	15%	10%	0.0%	0.0%	0.0%	0.0%
	P'	7.12	6.23	5.83	5.51	5.40	5.35		P'	6.90	6.55	6.15	4.81	4.54	4.27	4.27
Solvent Composition	Run 5															
	Time (min)	0	2.5	10	20	30										
	THF	0.0%	25%	40%	50%	40%										
	NMP	0.0%	0.0%	10%	50%	60%										
	MeCN	75%	60%	40%	0.0%	0.0%										
	H <sub>2</sub> O	25%	15%	10%	0.0%	0.0%										
	P'	6.90	6.01	5.61	5.35	5.62										



**Figure S1:** Progression of mobile phase gradient development (gradients described in Table S1) for the analytical scale separation of  $0.02 \text{ g L}^{-1}$  asphaltenes. Runs 1-9 progress in order from the top right to the bottom left.