

Table 1 – Effect of PEG molecular weight on the partition and purification of plasmid DNA from an *E. coli* alkaline lysate using ATPS. (Lysate composition: [pDNA] = 53.7 µg/ml, [Protein]=209.9 µg/ml; lysate load: 20% w/w)

System	Phase	[Plasmid] (µg/mL)	Plasmid yield (%)	[Protein] (µg/mL)
PEG 300 (24% w/w)	Top	20.9	78.0	77.2
(NH ₄) ₂ SO ₄ (18% w/w)	Bottom	0	0	0
PEG 400 (22% w/w)	Top	15.2	59.2	110.2
(NH ₄) ₂ SO ₄ (17% w/w)	Bottom	0	0	0
PEG 600 (20% w/w)	Top	0	0	52.4
(NH ₄) ₂ SO ₄ (15% w/w)	Bottom	21.6	88.4	0

Table 2 – Effect of tie-length on the partition and purification of plasmid DNA from an *E. coli* alkaline lysate using ATPS. (Lysate composition: [pDNA] = 53.7 µg/ml, [Protein]=209.9 µg/ml; lysate load: 20% w/w)

System	Tie-line length	Phase	[Plasmid] (µg/mL)	Plasmid yield (%)	[Protein] (µg/mL)
PEG 600 (20 % w/w)	38.16	Top	0	0	52.4
(NH ₄) ₂ SO ₄ (15% w/w)		Bottom	21.6	88.4	0
PEG 600 (22% w/w)	49.38	Top	0	0	93.8
(NH ₄) ₂ SO ₄ (17% w/w)		Bottom	17.9	66.7	0
PEG 600 (24% w/w)	59.01	Top	0	0	92.0
(NH ₄) ₂ SO ₄ (19% w/w)		Bottom	6.5	28.9	0
PEG 600 (26% w/w)	65.89	Top	0	0	78.8
(NH ₄) ₂ SO ₄ (21% w/w)		Bottom	0	0	0

Table 3 - Effect of phase volume ratio on the partition and purification of plasmid DNA from an *E. coli* alkaline lysate using ATPS. (Tie-line length: 38.16 % (w/w); lysate composition: [pDNA] = 53.7 µg/ml, [Protein]=209.9 µg/ml; lysate load: 20% w/w)

System	Phase ratio (v/v)	Phase	[pDNA] (µg/ml)	pDNA yield (%)	[Protein] (µg/ml)	Protein/pDNA (µg /µg)
PEG 600 (20% w/w)	1.1	Top	0	0	72	
(NH ₄) ₂ SO ₄ (5% w/w)		Bottom	21.6	80.6	0	0
PEG 600 (26% w/w)	1.5	Top	0	0	69.4	
(NH ₄) ₂ SO ₄ (12% w/w)		Bottom	29.8	94.4	0	0
PEG 600 (30% w/w)	3.0	Top	0	0	76.2	
(NH ₄) ₂ SO ₄ (9% w/w)		Bottom	49.1	100.6	18.4	0.37
PEG 600 (34% w/w)	6.2	Top	0	0	84	
(NH ₄) ₂ SO ₄ (7% w/w)		Bottom	90.4	100.9	27.6	0.31
PEG 600 (35% w/w)	9.3	Top	0	0	85.8	
(NH ₄) ₂ SO ₄ (6% w/w)		Bottom	143.9	107.2	11.7	0.08

Table 4 - Effect of lysate load on the partition and purification of plasmid DNA from an *E. coli* alkaline lysate using ATPS. (ATPS composition: PEG 600-35 % w/w, (NH₄)₂SO₄ - 6% w/w; tie-line length: 38.16 % (w/w); phase ratio: 9.3 v/v; lysate composition: [pDNA] = 39.4 µg/ml, [Protein]=222.7 µg/ml).

Lysate load (% w/w)	Phase	[pDNA] (µg/ml)	pDNA yield (%)	[Protein] (µg/ml)	Protein/pDNA (µg /µg)
20	Top	0	0	38.8	
	Bottom	102.0	113.3	5.85	0.06
30	Top	0	0	70.4	
	Bottom	136.2	100.8	12.0	0.09
40	Top	0	0	71.2	
	Bottom	307.8	85.4	35.9	0.12