

Table 1 Taguchi L₈ experimental parameters and levels for preparation of PCL-EFV nanoparticles

Symbol	Formulation parameters	Levels	
		1	2
A	W1	PVA	PBS
B	Sugar	Lactose	Trehalose
C	[W2-PVA]	1 %	2 %
D	[Sugar]	3 %	5 %
E	Solvent	DCM	EA
F	[W1]	1 %	2 %
G	[PEG]	0.5 %	1 %

W1 = Internal phase using PBS or PVA

W2 =External phase using PVA only

Sugar = Lactose or trehalose

Solvent= DCM or EA

[] = Concentration

Table 2 Taguchi L₈ experimental conditions and measured average particle size and polydispersity index of PCL-EFV nanoparticles

Formulation	Conditions							Results			
	W-1	Sugar	[W2-PVA]	[Sugar]	Solvent	[W1]	[PEG]	Average particle size(nm)	S/N ratio (Size)	PDI	S/N ratio (PDI)
1	PVA	Lactose	1	3	DCM	1	0.5	365.1±8.93	-51.16	0.362±0.01	8.45
2	PVA	Lactose	1	5	EA	2	1	252.2±1.55	-48.004	0.225±0.03	12.89
3	PVA	Trehalose	2	3	DCM	2	1	361.5±10.7	-51.19	0.412±0.05	7.33
4	PVA	Trehalose	2	5	EA	1	0.5	244.1±3.20	-47.77	0.135±0.05	17.53
5	PBS	Lactose	2	3	EA	N/A	1	253.9±4.36	-48.11	0.178±0.02	15.36
6	PBS	Lactose	2	5	DCM	N/A	0.5	383.8±12.45	-51.74	0.413±0.03	7.79
7	PBS	Trehalose	1	3	EA	N/A	0.5	237.7±1.34	-47.54	0.142±0.02	17.10
8	PBS	Trehalose	1	5	DCM	N/A	1	689.3±47.38	-56.65	0.630±0.05	33.88

Table 3 Average S/N ratio for each level of the parameters for particle size of PCL-EFV nanoparticles

Symbol	Factors	Mean S/N ratio		
		Level 1	Level 2	Maximum - minimum
A	W1	-49.534	-51.011	-1.478
B	Sugar	-49.753	-50.791	-1.038
C	[W2-PVA]	-50.839	-49.705	1.134
D	[Sugar]	-49.501	-51.043	-1.543
E	Solvent	-52.687	-47.858	4.829
F	[W1]	-50.923	-49.621	1.301
G	[PEG]	-49.555	-50.989	-1.434

Table 4 Average S/N ratio for each level of the parameters for PDI for PCL-EFV nanoparticles

Symbol	Factors	Mean S/N ratio		
		Level 1	Level 2	Maximum - minimum
A	W1	11.549	11.023	-0.526
B	Sugar	11.121	11.452	0.33
C	[W2-PVA]	10.573	11.999	1.426
D	[Sugar]	12.05	10.522	-1.529
E	Solvent	6.862	15.71	8.848
F	[W1]	11.305	11.268	-0.037
G	[PEG]	12.708	9.864	-2.844

Table 5 Taguchi L₈ proposed optimum conditions for formulating PCL-EFV nanoparticles

Symbol	Factors	Level desc.	Level	Contribution
A	W1	PVA	1	0.738
B	Sugar	Lactose	1	0.518
C	[W2-PVA]	2 %	2	0.567
D	[Sugar]	3 %	1	0.770
E	Solvent	EA	2	2.414
F	[W1]	2 %	2	0.651
G	[PEG]	0.5 %	1	0.717

Table 6 Analysis of variance for particle size of PCL-EFV nanoparticles

Symbol	Factors	DOF	Sums of squares	Variance	F-Ratio	Pure sum	Percent (%)
A	W1	1	4.361	4.361	0.000	4.361	6.414
B	Sugar	1	2.150	2.150	0.000	2.150	3.163
C	[W2-PVA]	1	2.572	2.572	0.000	2.572	3.783
D	[Sugar]	1	4.752	4.752	0.000	4.752	6.989
E	Solvent	1	46.639	46.639	0.000	46.639	68.596
F	[W1]	1	3.391	3.391	0.000	3.391	4.988
G	[PEG]	1	4.119	4.119	0.000	4.119	6.058
	Other/Error	0	0.000	0.000			0.000
	Total	7	67.991				100.000

Table 7 Estimated and experimental results for particle size and PDI for PCL-EFV nanoparticles

	Average particle size (nm)		PDI	
	Particle size (nm)	S/N ratio	PDI	S/N ratio
Prediction	157	-45.53	0.112	19.05
Experimental	217	-46.73	0.093	20.63