Evaluation of inhibitory potential of HPMC, PVP and HPC polymers on nucleation and crystal growth

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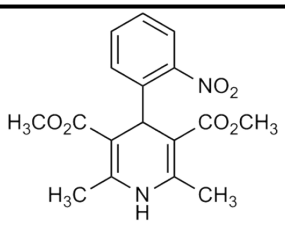
Electronic Supplementary Information

Table S1 Physicochemical properties of nifedipine

Properties	**Nifedipine**
Structure	
Molecular formula	$C_{17}H_{18}N_2O_6$
Molecular weight (g/mol)	346.33
Melting point (°C)	172-174
Glass transition temperature (°C)	47
Log P	2.2
pKa	5.33
Aqueous solubility (µg/mL)	Insoluble (~5)

Use	Anti hypertensive, Angina Pectoris
Solubility parameter	21.41
Crystallization tendency classification (under cooled melt)	Class II

Table S2 Properties of polymers (DP- degree of polymerization, Mw- molecular weight, Mn- monomer number, HA- hydrogen bond acceptor, HD- hydrogen bond donor, Tg- glass transition temperature, S- solubility of nifedipine in 5 % w/v polymeric solution, HP- hydroxypropoxy content and MC- methoxy content)

Polymer	**DP**	**Mw**	**Mn**	**HA**	**T_g**	**Vi, 2.0% in water, mPa.s**	**S**	**HP**	**MC**
HPMC E3	37	10000	264	6	174	3.2	0.0409	8.8	29.4
HPMC E5	37	10000	264	6	154	5	0.0449	9.2	28.4
HPMC E6	49	13000	264	6	156	6.2	0.0421	9.1	28.7
HPMC E15	49	13000	264	6	172	16.6	0.0427	9.7	28.2
HPMC E50	75	20000	264	6	174	48	0.0479	9	28.8
HPMC K4M	155	41000	264	6	191	4927	0.0557	8.2	23.3
HPMC K15M	416	110000	264	6	198	7382	0.0325	8.6	23.1
HPMC K100M	530	140000	264	6	198	113384	0.0473	10.5	22.8
PVP K17	81	9000	111	2	136	2.5	0.0872	-	-
PVP K25	279	31000	111	2	155	4.5	0.1505	-	-
PVP K30	441	49000	111	2	168	7	0.0728	-	-
HPC L	381	140000	367	16	126	9	0.0108	65.3	-
HPC M	1689	620000	367	16	205	330	0.0186	64.8	-
HPC H	2479	910000	367	16	208	2350	0.0101	70.1	-
HPC SL	272	100000	367	16	180	5.2	0.0066	69.7	-
HPC SSL	108	40000	367	16	180	2.4	0.0053	69.4	-

Table S3 Stability assessment by UV- visible method

Time (hr)	**% degradation**
0	0
1	0.6803
2	0.7311
3	1.0175
4	1.5843

Figures

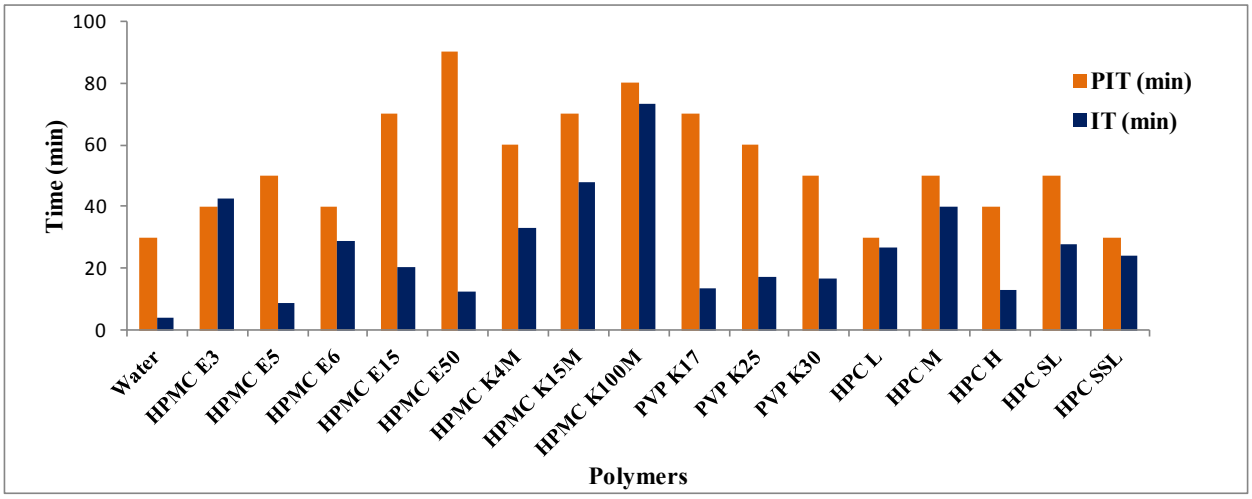


Fig. S1 PIT and IT of nifedipine in presence and absence of polymers

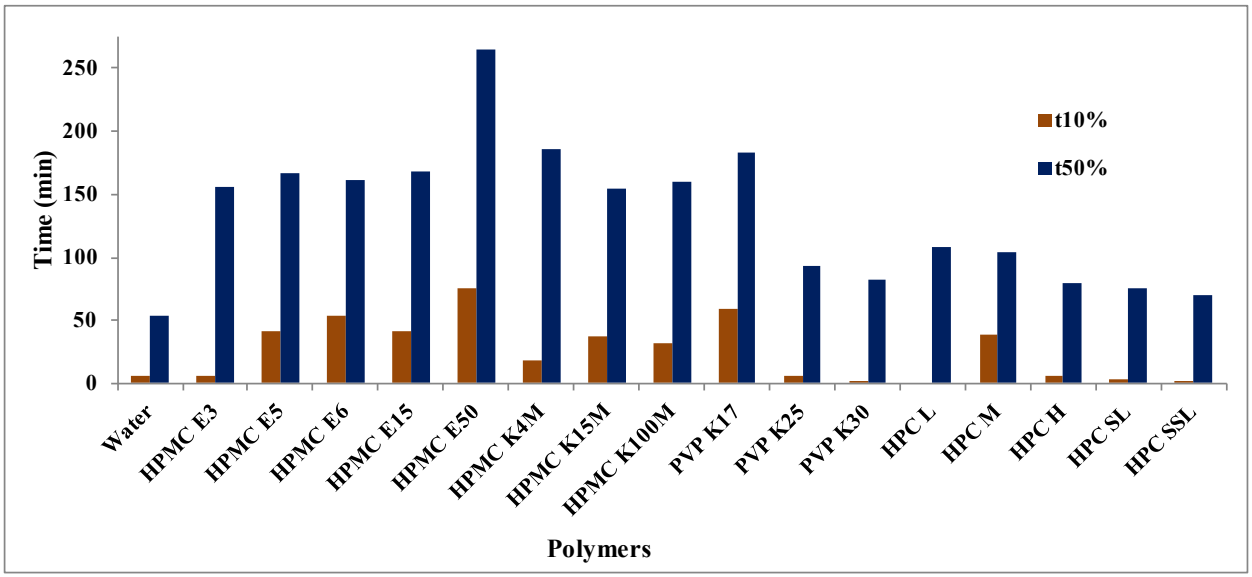


Fig. S2 $t_{10\%}$, and $t_{50\%}$ parameters obtained after precipitation of nifedipine in absence and presence of polymer

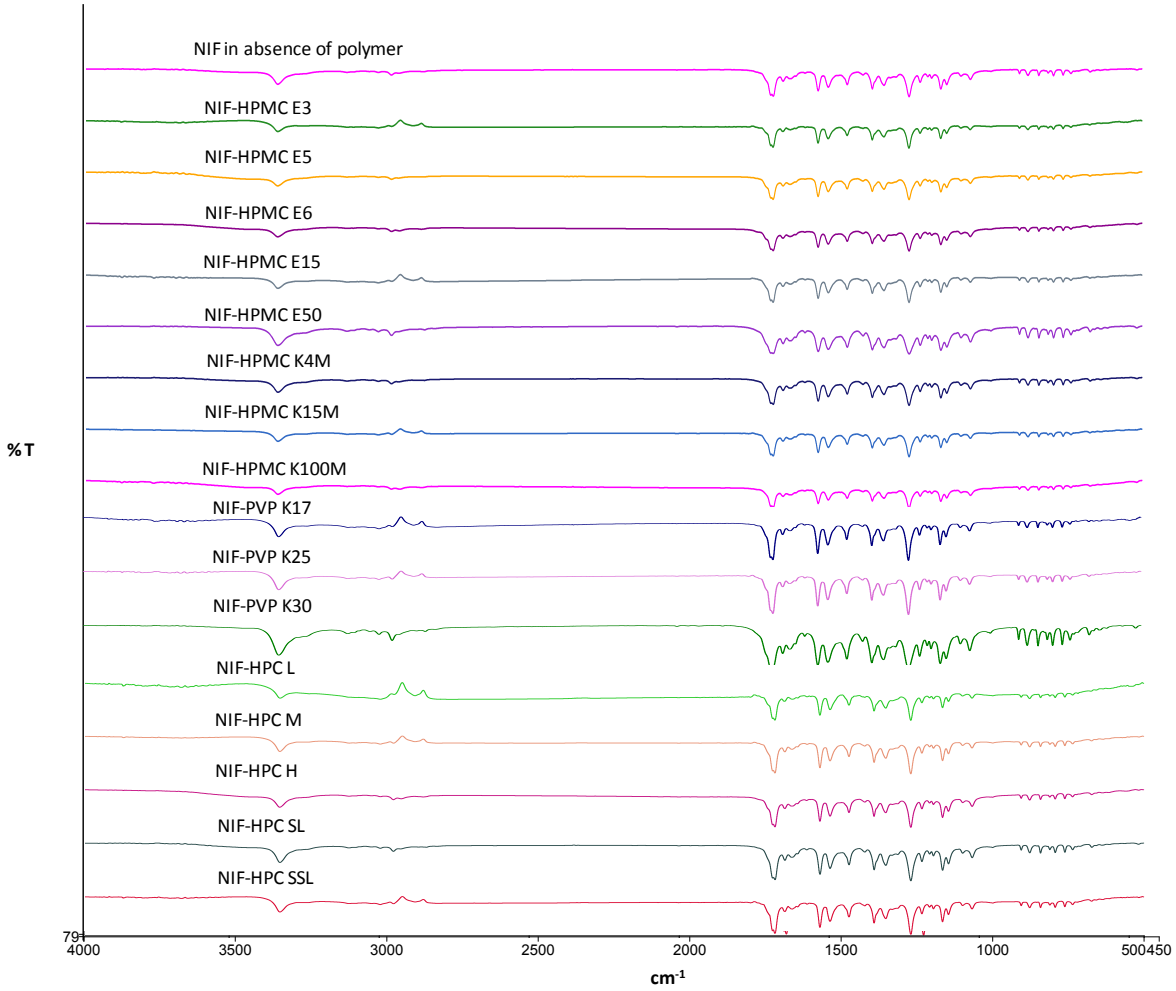


Fig. S3 FT-IR spectra of precipitates of nifedipine in absence and presence of polymers

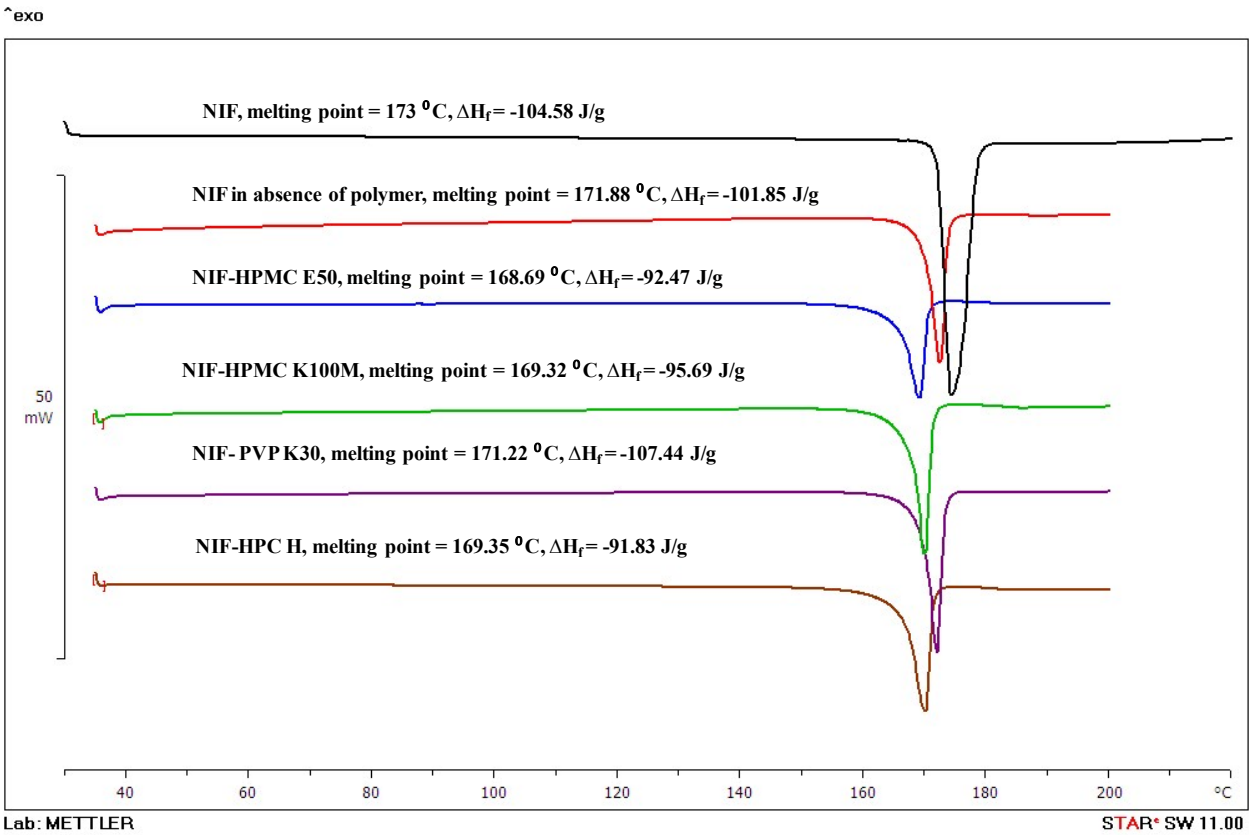


Fig. S4 DSC thermograms of precipitates of nifedipine (NIF) in absence and presence of polymers with plain drug