

Supporting Information

Roles of phosphoric acid on crystallization of Lenalidomide Form DH – water system

Ruili Liang^a, Yitong Zhu^a, Yanyang Wu^a, Xing Gu^a, Xiangyang Zhang^{a,*}

^a State Key Laboratory of Chemical Engineering, East China University of Science and Technology, Shanghai 200237, China

List of table and figure captions

Figure S1. PXRD pattern of undissolved solid after solubility experiments.

Figure S2. PXRD pattern of crystals after crystallization experiments.

Table S1. The induction time of dicyandiamide in water.

Table S2 The maximum, average, minimum induction time of LDM Form DH in pure water and phosphoric acid solution.

Figure S1. PXRD pattern of undissolved solid after solubility experiments.

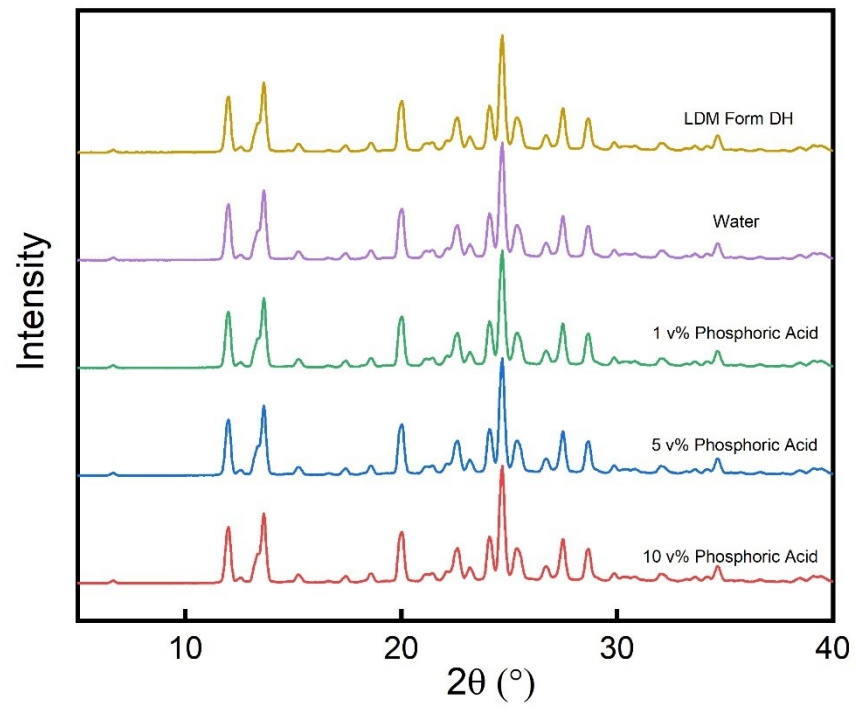


Figure S2. PXRD pattern of crystals after crystallization experiments.

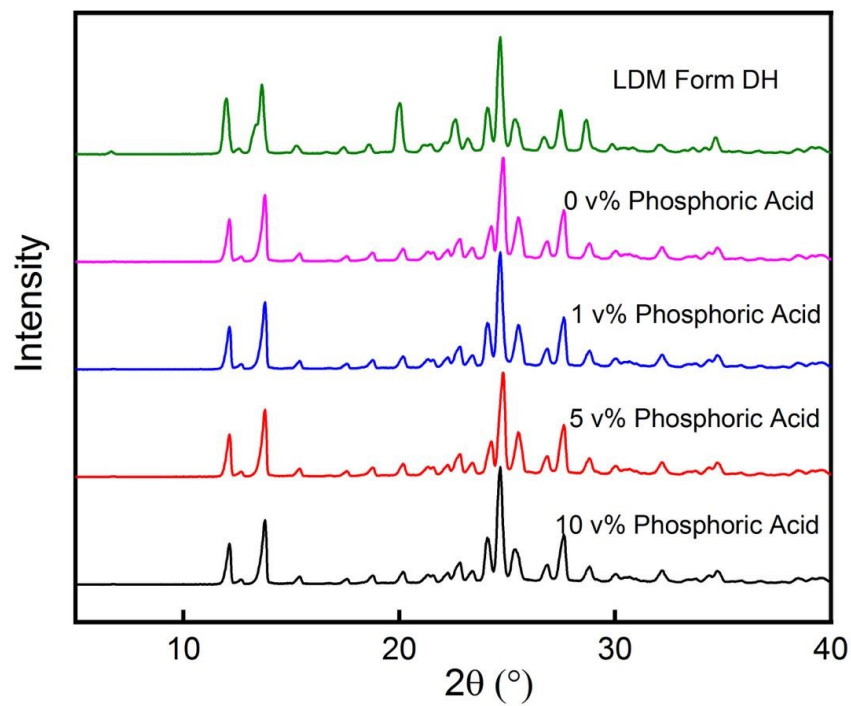


Table S1. Mole fraction solubility of LDM Forms DH in different volume ratios (v%) of phosphoric acid solutions (0 v%, 1 v%, 5 v%, 10 v%) under different temperature (T) and atmospheric pressure (p = 0.1 MPa).^a

Phosphoric Acid solutions	T (K)	10^4x_1 (mol/mol)	10^4x_{cal} (mol/mol)	RD (%)
0 v%	303.15	0.11	0.08	21.07
	313.15	0.25	0.19	24.77
	323.15	0.37	0.39	-4.97
	333.15	0.67	0.77	-14.59
	343.15	0.99	1.46	-47.36
1 v%	303.15	1.82	1.89	-2.09
	313.15	2.06	2.01	2.06
	323.15	2.32	2.29	1.45
	333.15	2.78	2.73	0.47
	343.15	3.12	3.18	-2.06
5 v%	303.15	10.70	11.05	-3.28
	313.15	12.71	12.24	3.68
	323.15	14.81	14.50	2.06
	333.15	18.24	18.16	0.46
	343.15	23.06	23.89	-3.59
10 v%	303.15	20.28	20.99	-3.52
	313.15	24.34	23.87	1.91
	323.15	30.73	28.91	5.92
	333.15	37.44	36.94	1.33
	343.15	46.45	49.74	-7.07

^a Standard uncertainties u are $u(x)=\pm 0.00005$, $u(T)=\pm 0.01$ K, $u(v)=\pm 0.01\%$, $(p)=\pm 0.0025$ MPa. The volume fractions of phosphoric acid(v) corresponds to the volume fraction of phosphoric acid in the binary (phosphoric acid+water) solvent. x_{cal} are the calculated values of Forms DH by NRTL model.

Table S2 The maximum, average, minimum induction time of LDM Form DH in pure water and phosphoric acid solution^a.

Pure water				
ΔT	S	$mean t_{ind}(s)$	$max t_{ind}(s)$	$min t_{ind}(s)$
12	2.03	7864	10223	3964
14	2.32	4996	7234	2137
16	2.67	3592	6321	2098
18	3.07	2684	4032	1386
1 v% Phosphoric Acid				
ΔT	S	$mean t_{ind}(s)$	$max t_{ind}(s)$	$min t_{ind}(s)$
12	1.18	1801	3221	1076
14	1.21	862	1532	672
16	1.24	508	1263	304
18	1.27	422	564	273
5 v% Phosphoric Acid				
ΔT	S	$mean t_{ind}(s)$	$max t_{ind}(s)$	$min t_{ind}(s)$
12	1.26	2654	4981	1854
14	1.30	1743	3176	894
16	1.36	1267	1894	943
18	1.41	909	1371	432
10 v% Phosphoric Acid				
ΔT	S	$mean t_{ind}(s)$	$max t_{ind}(s)$	$min t_{ind}(s)$
12	1.30	6049	8752	3358
14	1.36	3964	5084	2480
16	1.43	2505	4224	1082
18	1.50	1439	2176	654

^a ΔT represents the temperature difference between initial temperature and nucleation temperature. S is the supersaturation calculated by solubility curve. The maximum, average, minimum induction time is from the induction time measurement