Supporting information

New insight in improving solubility of poorly soluble drugs by preventing the formation of their hydrogen-bonds: a case of dapsone salts with camphorsulfonic and 5-sulfosalicylic acid

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Table and figure captions

Table S1. Crystallographic parameters of **DAP-CAM and DAP-SSA**.

	DAP-CAM	**DAP-SSA**
Empirical formula	$C_{22}H_{28}N_2O_6S_2$	$C_{26}H_{24}N_2O_{14}S_3$
Formula weight	480.58	684.65
Crystal temperature (K)	298	298
Crystal system	Monoclinic	Monoclinic
Space group	$P2_1/c$	$C2/c$
Z	4	8
a(Å)	6.3273(4)	39.252(5)
b(Å)	12.3383(7)	13.2429(16)
c(Å)	29.2787(16)	11.3983(15)
α(deg)	90.00	90.00
β(deg)	95.255(2)	103.326(3)
γ(deg)	90.00	90.00
V(Å3)	2276.1(2)	5765.4(13)
Dx($Mg.cm^{-3}$)	1.403	1.578
μ(mm^{-1})	0.276	0.334
F(000)	1016.0	2832.0
R_{int}	0.0421	0.0351
No.of collected data(unique)	27753	23829
No.of data with I>2σ(I)	3415	5868
No.of parameters varied	300	413
s	1.223	1.119
R_1	0.0821(3415)	0.0626(5868)
wR_2	0.1853(3947)	0.1612(6899)

Table S2. Hydrogen bonds in crystal **DAP-CAM**.

D-H···A	**D-H (Å)**	**H···A (Å)**	**D···A (Å)**	**D-H···A (°)**	**Symmetry Code**
N2-H2A···O3**(i)**	0.890	1.838	2.725	174.94	-x+1, -y+1, -z+1
N2-H2B···O4**(ii)**	0.890	1.800	2.686	173.82	-x+2, -y+1, -z+1
N1-H1A···O3**(iii)**	0.789	2.563	3.132	130.33	-x+1, -y, -z+1
N1-H1B···O5**(iv)**	0.740	2.291	3.021	169.37	-x+2, -y, -z+1
N2-H2C···O2**(v)**	0.891	2.130	2.886	142.24	-x+1, y+1/2, -z+3/2

Table S3. Hydrogen bonds in crystal **DAP-SSA**.

D-H···A	D-H (Å)	H···A (Å)	D···A (Å)	D-H···A (°)	Symmetry Code
N1-H1A···O9**(i)**	0.890	2.295	2.951	130.44	x-1/2, -y+3/2, z-1/2
N1-H1B···O10**(ii)**	0.891	2.203	3.039	156.33	-x+3/2, y+1/2, -z+1/2
N2-H2A···O5**(iii)**	0.890	1.941	2.831	177.71	-x+1, -y-1, -z+1
N2-H2C···O3**(iv)**	0.890	1.862	2.731	164.78	x, y, z
N1-H1C···O7**(v)**	0.891	1.963	2.840	167.58	x-1/2, -y+3/2, z-1/2
N2-H2B···O13**(vi)**	0.889	2.092	2.734	128.39	x, y, z
O6-H6A···O7**(vii)**	0.818	1.907	2.621	145.15	x, y, z
O12-H12A···O13**(viii)**	0.821	1.930	2.569	134.01	x, y, z
O8-H8A···O9**(ix)**	0.819	1.794	2.608	172.80	x, y, z
O14-H14···O4**(x)**	0.820	1.915	2.727	170.32	-x+3/2, y-1/2, -z+1/2

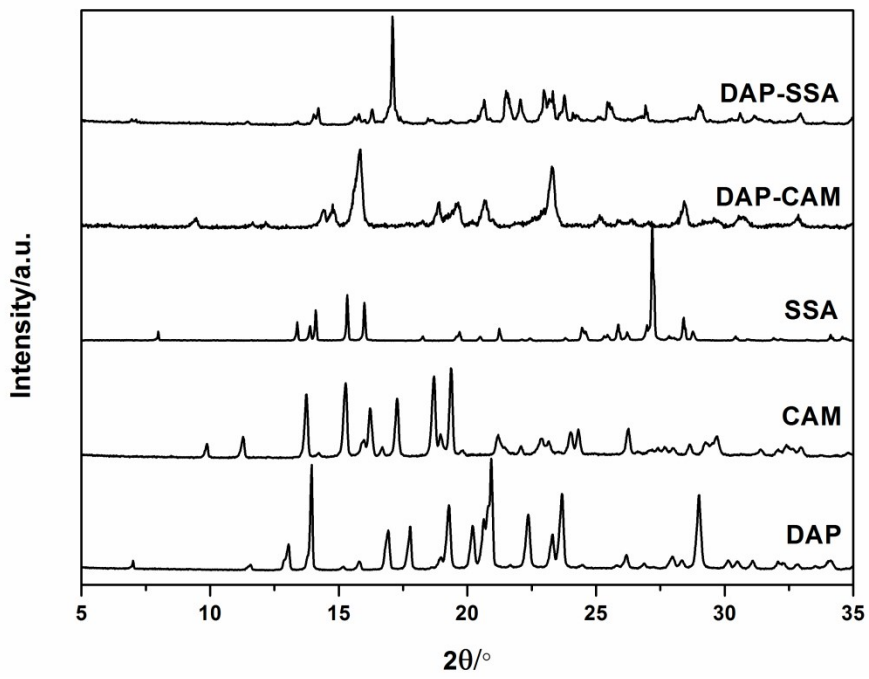

Figure S1. PXRD patterns of grinding products of **DAP** with **CAM** in a 1:1 stoichiometric ratio and **DAP** with **SSA** in a 1:2 stoichiometric ratio.

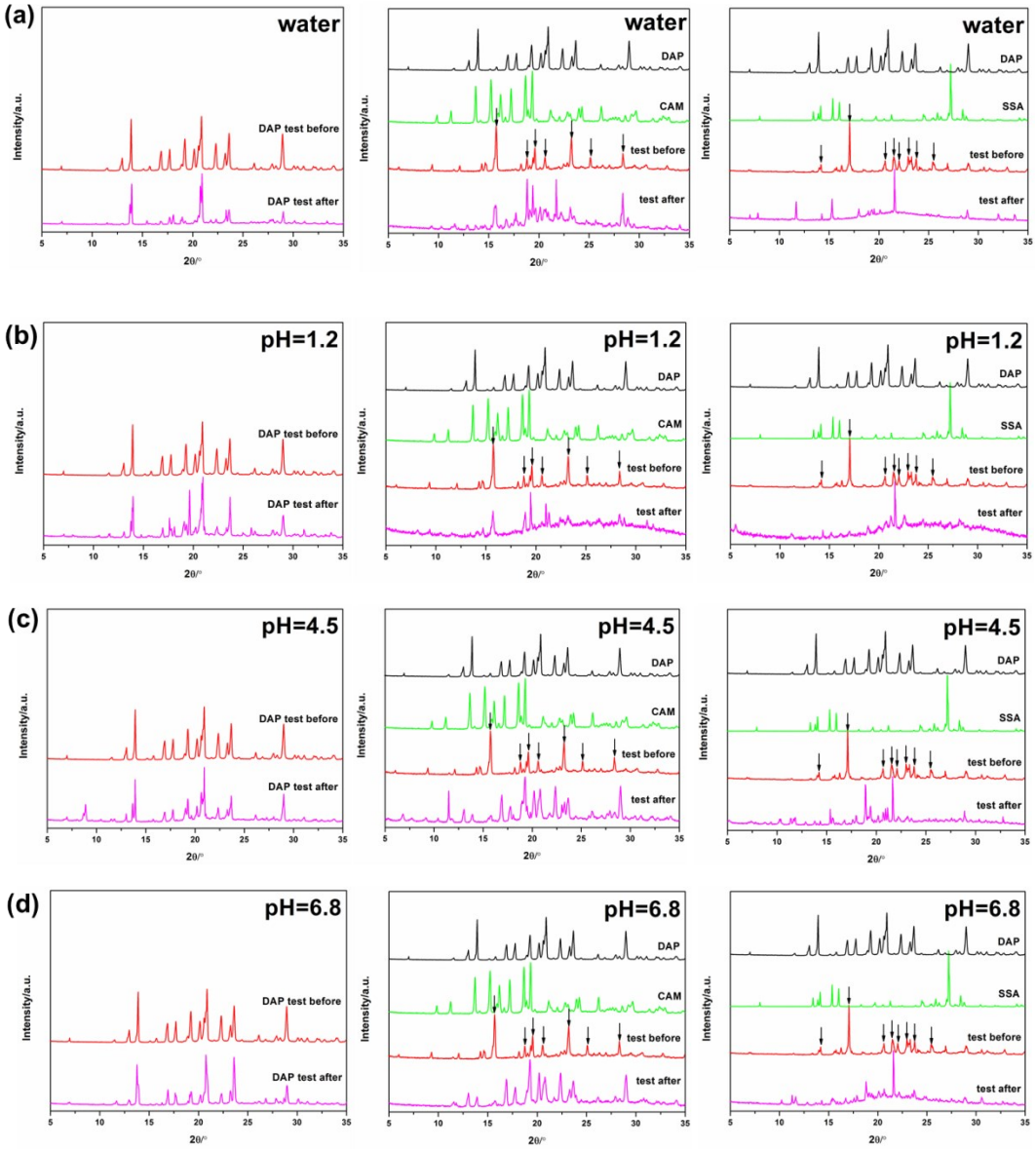

Figure S2. Phase transformation of the residues of **DAP**, **DAP-CAM** and **DAP-SSA** after solubility in (a) water (b) pH = 1.2 buffer solution (c) pH = 4.5 buffer solution (d) pH = 6.8 buffer solution, measured by PXRD.

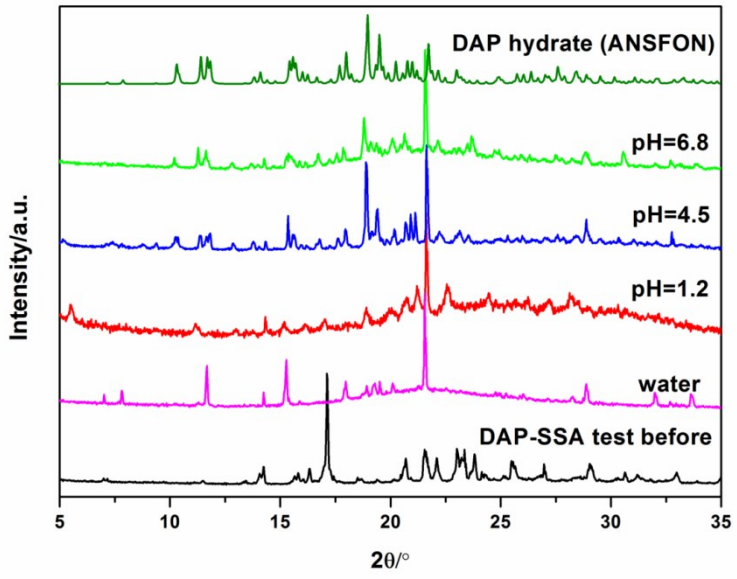

Figure S3. Phase transition from **DAP-SSA** to **DAP** hydrate after solubility test.

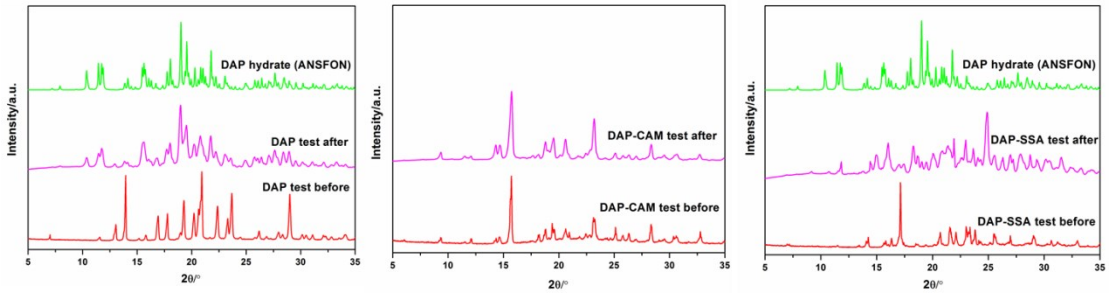

Figure S4. Phase transformation of the residues of **DAP**, **DAP-CAM** and **DAP-SSA** after IDR experiments.