**SUPPLEMENTARY MATERIAL**

All the data given in tables in the manuscript are shown as Figures for four drug compounds in Figures 1-4. As the experimental data and calculated data from the proposed model are in good agreement, we preferred to show the actual numeric data in the tables in the manuscript and supplementary data as figures are shown below.







Fig 1. Experimental and modeling solubility data for Benzamide (a) T=308 K (b) T=318 K (c) T=328 K









Fig 2. Experimental and modeling solubility data for Cetrizine (a) T=308.15 K (b) T=318.15 K (c) T=328.15 K (d) T=338.15 K







Fig 3. Experimental and modeling solubility data for Metaxalone (a) T=308.2 K (b) T=318.2 K (c) T=328.2 K



Fig 4. Experimental and modeling solubility data for Niflumic Acid (a) T=313.2 K (b) T=333.2 K (c) T=353.2 K