Title: Contrasting Melting Behavior of Zinc Stearate and Zinc Oleate

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Supporting Information

1. (a) X-ray diffraction patterns of saturated fatty acid Zn soaps as function of chain length and (b) Plot of interlayer spacing vs. number of methylene units in the chains.
2. X-ray diffraction patterns of Zn-Stearate at different temperatures.
3. X-ray diffraction patterns of Zn–Oleate at different temperatures.
4. Methylene stretching modes in the infrared spectrum of Zn-Stearate at different temperatures.
5. Table of frequencies and assignments of the infrared progression bands of Zn-Stearate and Zn-Oleate

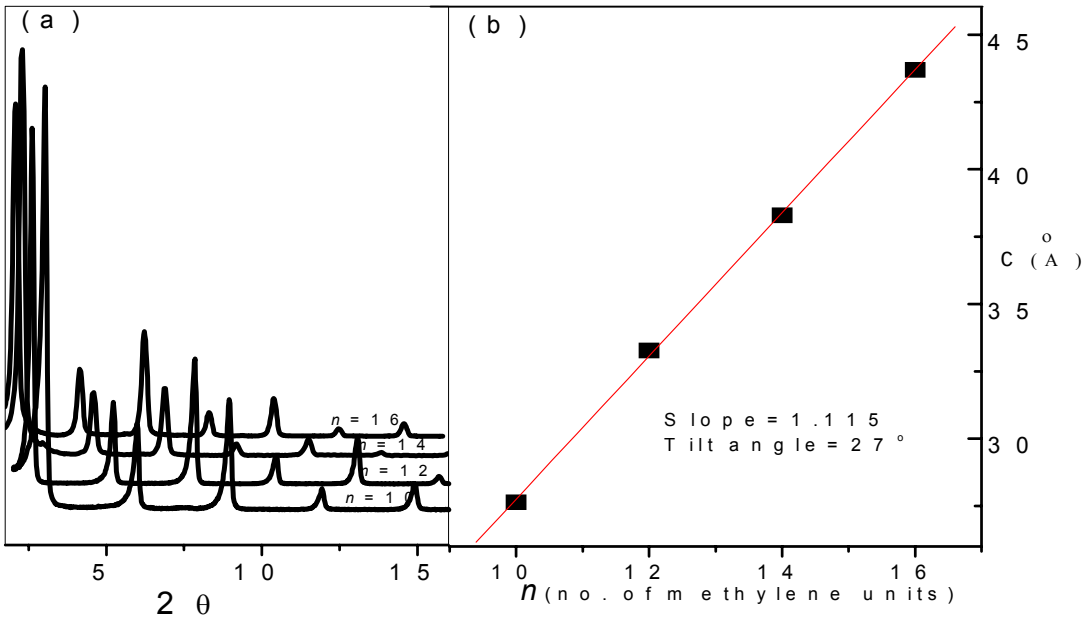

Figure: (a) X-ray diffraction patterns of saturated fatty acid Zn-soaps as function of chain length (*n* = number of methylene units) and (b) Plot of interlayer spacing, *c*, *vs.* number of methylene units in the chains.

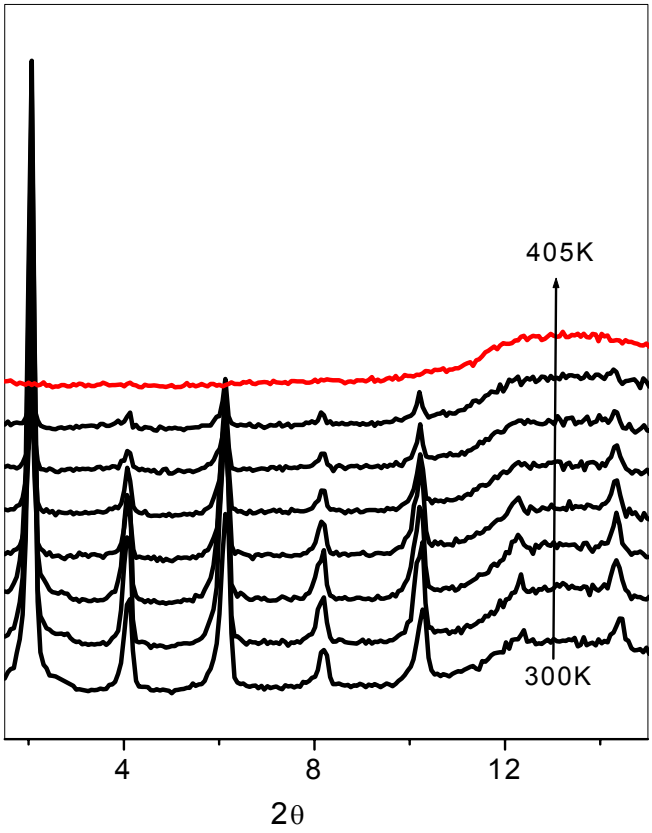

Figure: X-ray diffraction patterns of Zn-Stearate at different temperatures. The pattern at melt is shown in red.

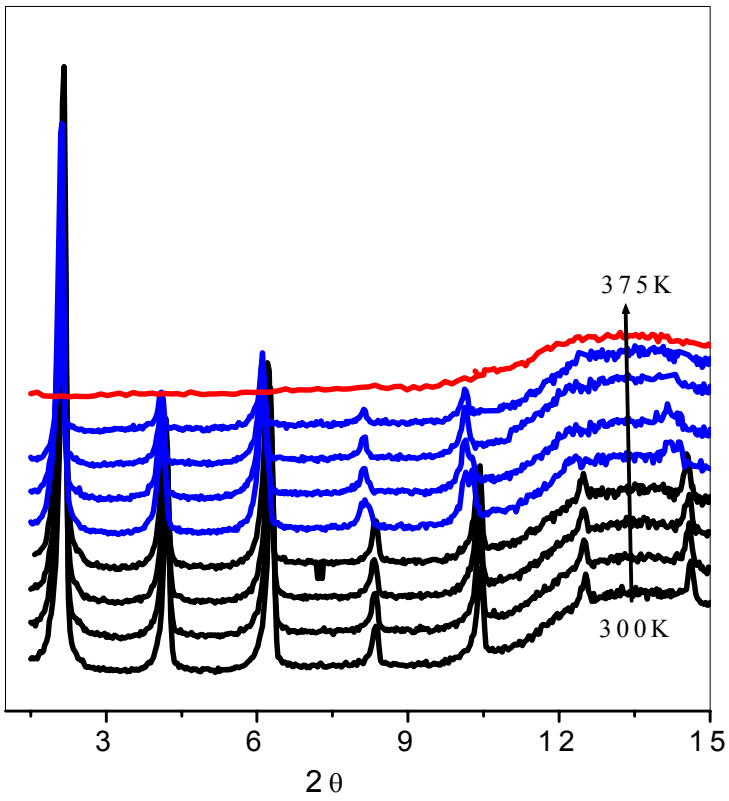

Figure: X-ray diffraction patterns of Zn–Oleate at different temperatures. The pattern above the transition at 357K is shown in blue. The pattern at melt is shown in red.

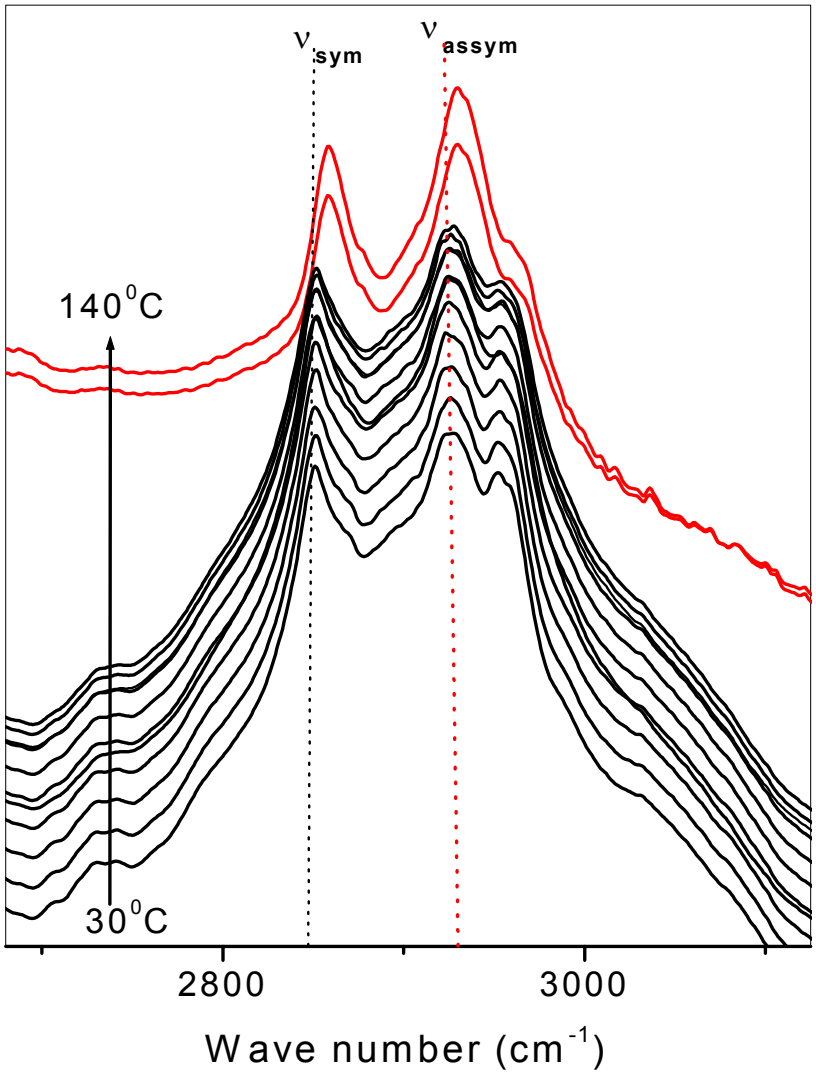

Figure . Methylene stretching modes of Zn-stearate at different temperatures. The spectra after melt is shown in red.

Table of frequencies and assignments of the methylene wagging (W_k), twisting-rocking (T_k), rocking-twisting(R_k) and C-C stretch (S_k) progression bands in the infrared spectrum of Zn-stearate and Zn-oleate.(*n* is the number of coupled *trans* methylene units considered in the assignment)

Zn-Oleate *n* = 7		Zn-Stearate *n* = 16	
$\nu_{(cm^{-1})}$	Assignment	$\nu_{(cm^{-1})}$	Assignment
1352	W_5	1360	W_{10}
1323	W_4	1339	W_9
1304	T_4	1324	W_8
1280	W_3	1306	W_7
1258	T_3	1286	W_6
1237	W_2	1266	W_5
1214	T_2	1247	W_4
1200	W_1	1228	W_3
1192	T_1	1208	W_2
1094	S_1	1188	W_1
1066	S_6	1105	S_1
1049	S_5	1075	S_2
1028	S_2	1064	S_{12}
1010	S_4	1053	S_{11}
984	S_3	1041	S_{10}
953	R_1	1032	S_9
933	R_2	1016	S_8
889	R_3	990	S_7
849	R_4	970	S_6
826	R_5	911	R_5
781	R_6	874	R_6
721	R_7	840	R_7
		808	R_8
		780	R_9
		758	R_{10}
		745	R_{11}
		720	R_{12} - R_{16}