Supporting information for

Polymer-directed Crystallization of HMX to Construct Nano-/Microstructured Aggregates with Tunable Polymorph and Microstructure

Xin Zhou[a], Yan Ren[b], Hongzhen Li[a*], Xiaoqing Zhou[a], Shilong Hao[a], Rong Xu[a], Qi Zhang[a]

[a]*Institute of Chemical Materials, CAEP, Mianyang, Sichuan, 621999, China*
[b]*Mianyang City College, Mianyang, Sichuan, 621000, China*

Table S1 Crystal structure information of the HMX polymorphs

Sample	Conformation	Space group	Z	$\rho_{meas.}$ (g/cm^3)
δ-HMX	boat-boat	$P6_1$	6	1.80[a]
γ-HMX	boat-boat	*Pc*	4	1.76[a]

Note: [a] data collected from reference (*Miller, G. R et al, Review of the Crystal Structures of Common Explosives. Part 1: RDX, HMX, TNT, PETN, and Tetryl*)

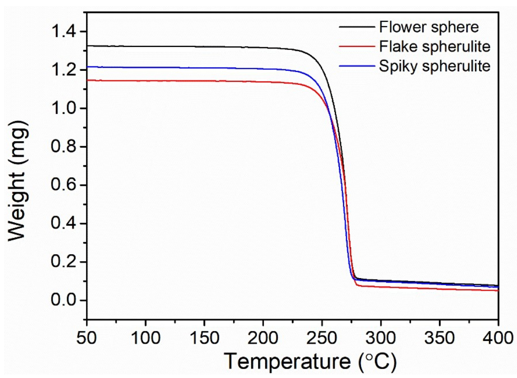

Figure S1 TG-curves of the sphere aggregates

Table S2 HPLC results of the aggregates

Sample	PVP (wt.%)	HMX (wt.%)
Flower sphere	6.8	93.2
Spiky spherulite	6.6	93.4
Spiky spherulite	8.1	91.9

The critical drop height with 50% explosion probability (H_{50}) was determined according to GJB-772A-97 standard method 601.2. Specifically, the sample (30 mg for each test) was tested 25 times to obtain H_{50}, which represents the height from which dropping a 2.5 kg weight will result in a 50% explosive event of the trials. We found that the spiky spherulite' H_{50} was 90.0 cm. The impact energy was then calculated as 22 J based on equation

$$E=mgH_{50}$$

where m is the hammer weight, g is the gravity constant. Then we compared this data with needle γ-HMX in a previous report (*Xiaolan Song et al, Journal of Hazardous Materials 2008, 159, 222-229*) and the results are listed in Table 1.

Table S3 Comparison of the mechanical sensitivity

Sample	Impact energy with 50% explosion probability	IS	FS
Needle γ-HMX	8.4 J	82%	100%
Spiky spherulite	22.1 J	20%	60%

Clearly, spherulitic structuring of the γ-HMX significantly increases the impact energy by almost 3-fold, which demonstrates the excellent desensitizing capability of our strategy.