Electronic Supplementary Material (ESI) for CrystEngComm.
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One-dimensional lead borate nanowhiskers for joint shielding of neutron and gamma radiations: controlled synthesis, microstructure, and performance evaluation

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Table S1 Mass fractions of elastomeric composites

Sample	EPDM	TAIC[a]	DCP[a]	ZnO	SA	$Pb_3B_{10}O_{16}[OH]_4$
S1	100	5	3.5	10	1	0
S2	95	5	3.5	10	1	5
S3	90	5	3.5	10	1	10
S4	80	5	3.5	10	1	20
S5	70	5	3.5	10	1	30
S6	60	5	3.5	10	1	40
S7	50	5	3.5	10	1	50
S8	40	5	3.5	10	1	60
S9	30	5	3.5	10	1	70

a Curing agent (TAIC-Triallyl isocyanurate, DCP -Dicumyl peroxide). The curing condition was 160°C, 13 MPa and 30 min.

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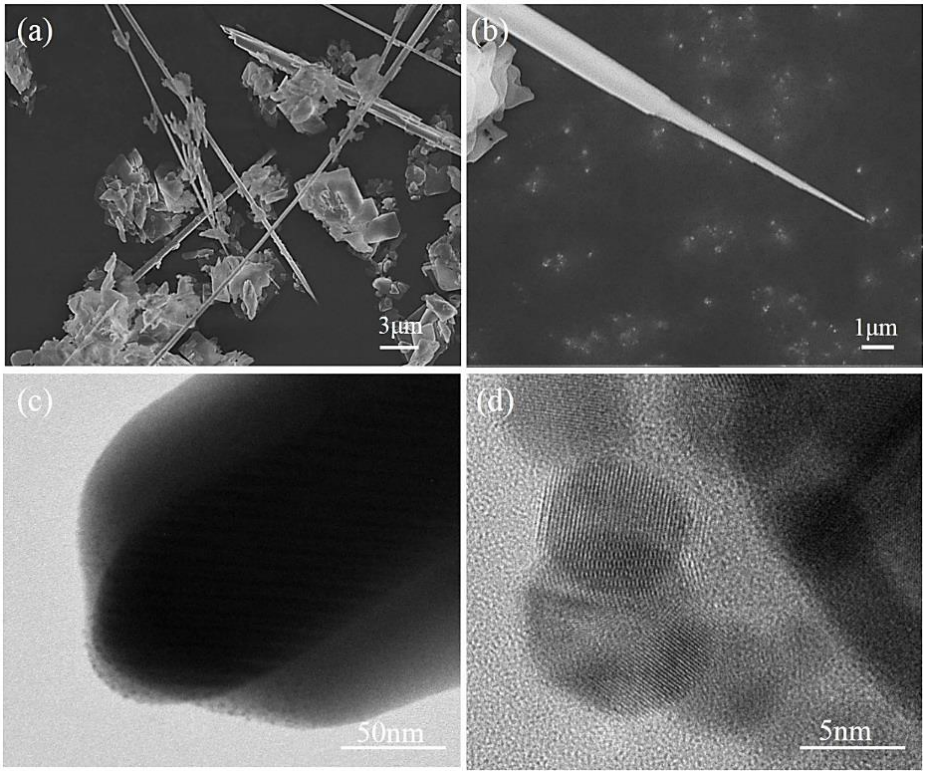

Figures S1: SEM (a) Low-resolution images of lead borate nanowhiskers, (b) top view high-resolution image; TEM (b) High-magnification TEM image and (d) HRTEM image of the tip of the nanowhiskers. The reaction time is 5h.

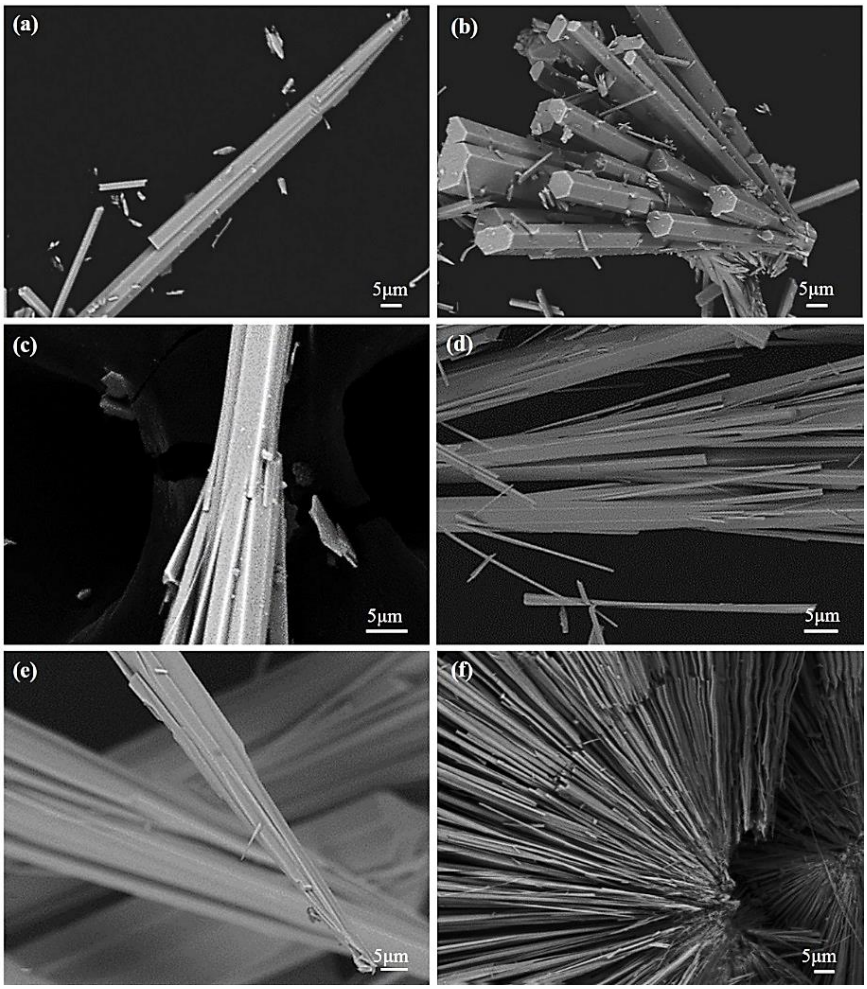

Figure S2 Similar head-to-head overlapped and side-by-side oriented attachment growth phenomena were also captured in the solvothermally synthesized lead borate nanowhiskers obtained at 230 °C for 12h

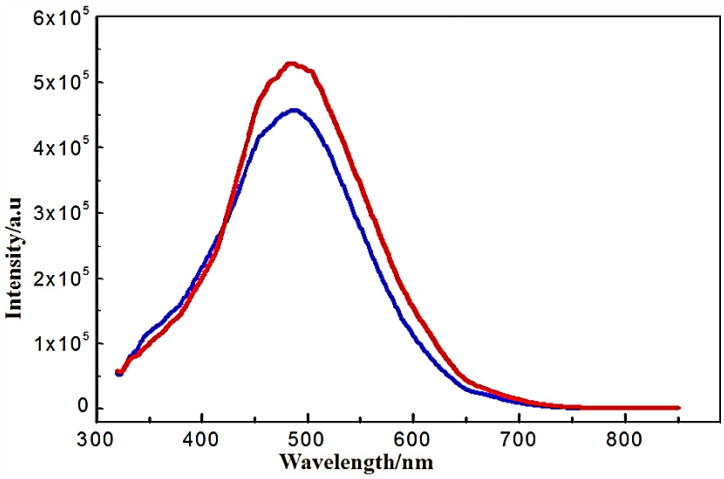

Figure S3 PL spectra of the lead borate whiskers, the blue curve and red curve corresponds to the micro-whiskers and nano-whiskers, respectively

Table S2 The Thermal Properties of different size of lead borate whiskers

	Thermal conductivity(W/mK)	Thermal resistance(10^3m^2KW)
Micro-whiskers	0.261	0.3613
Nano-whiskers	0.274	0.3442

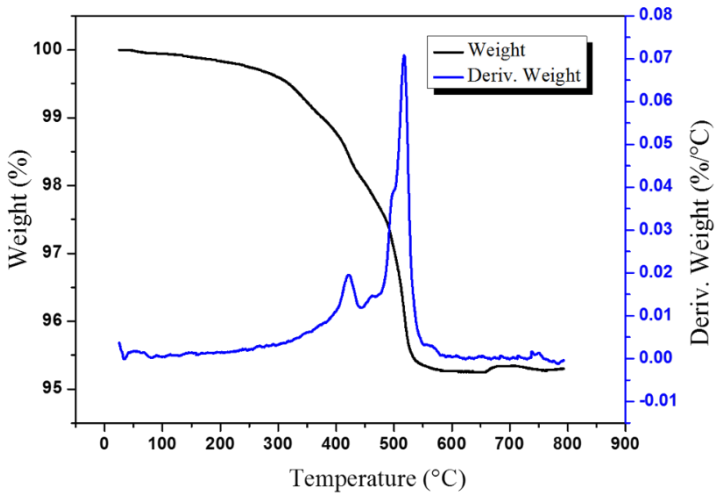

Figure S4 TG-DTG curve of nanowhiskers

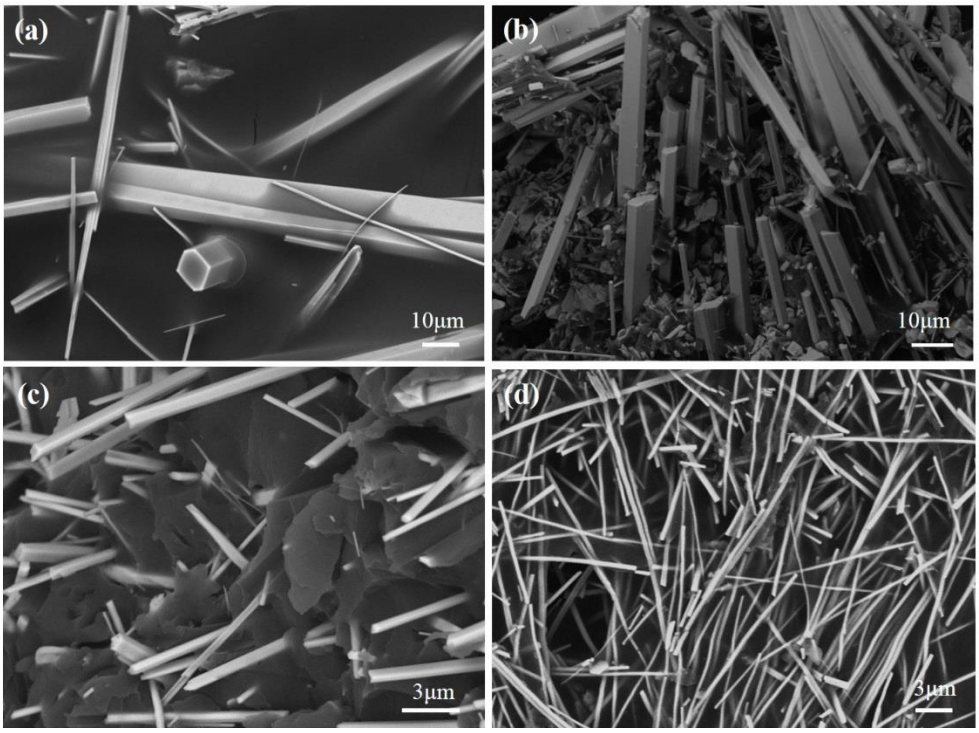

Figure S5 SEM images of the cross section of composite material, (a, c) 30%, (b, d) 50% different of size of lead borate nanowhiskers dispersed EPDM composites