Electronic Supplementary Material (ESI) for CrystEngComm.

Supplementary information

Growth condition effect on the structure evolution and electrical property in low-melting bismuth films

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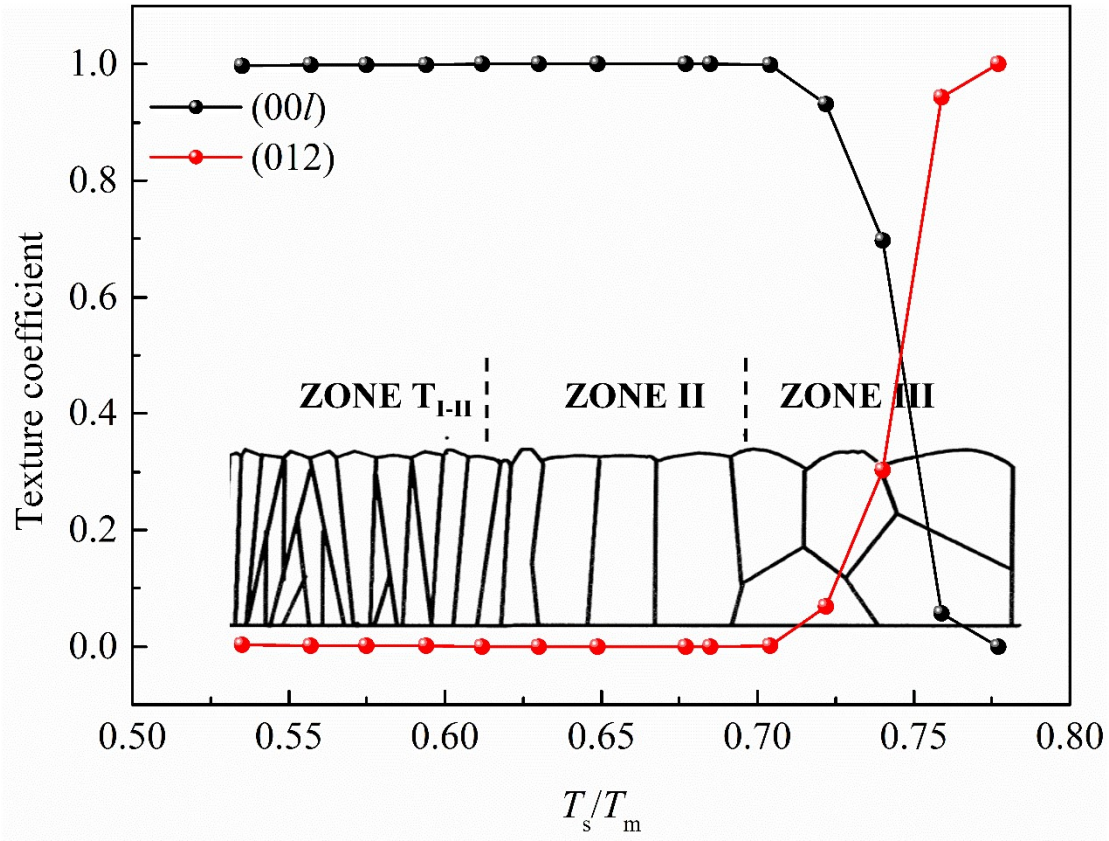

Fig. S1. Basic structure zone models of thin films with different T_s/T_m.

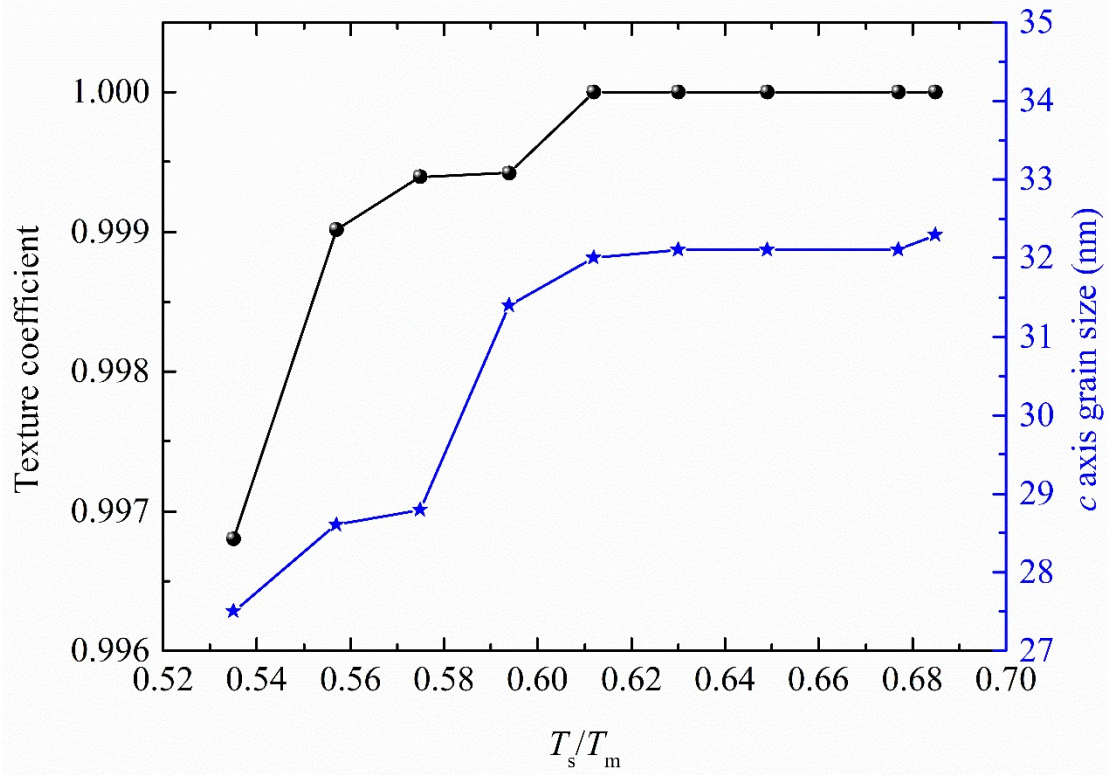

Fig. S2. The texture coefficient and out-of-plane grain size of Bi thin films at different substrate temperatures.

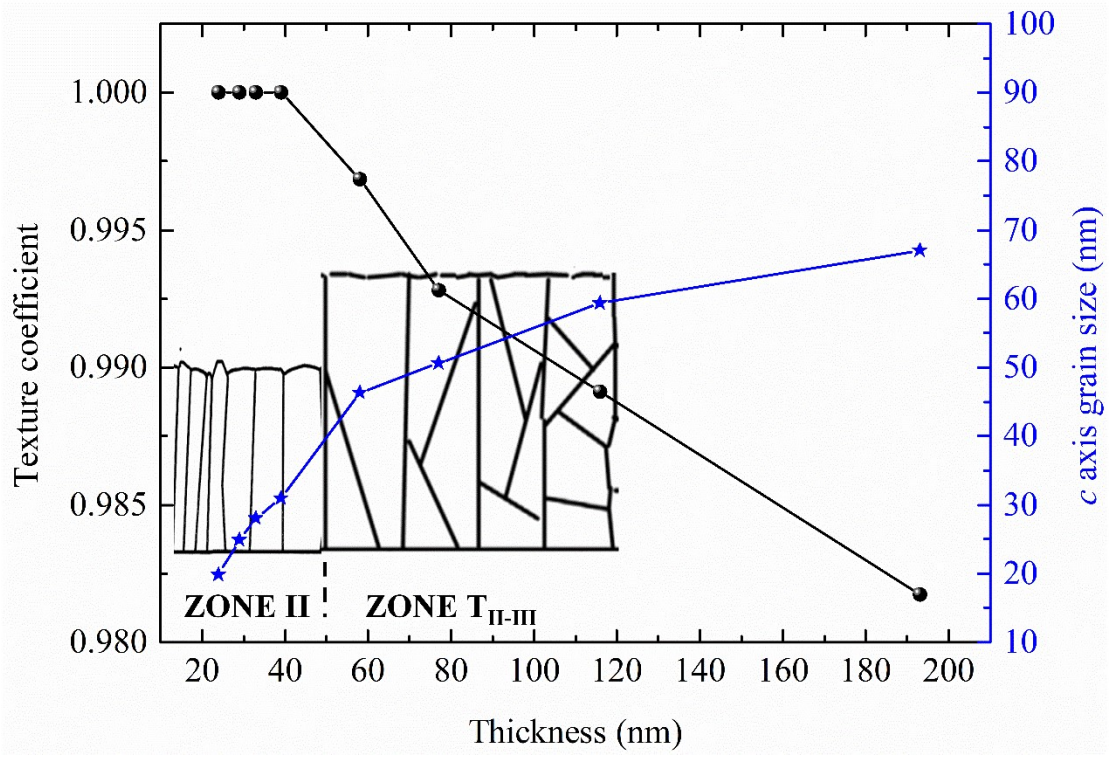

Fig. S3. Basic structure zone models of thin films with different thicknesses.

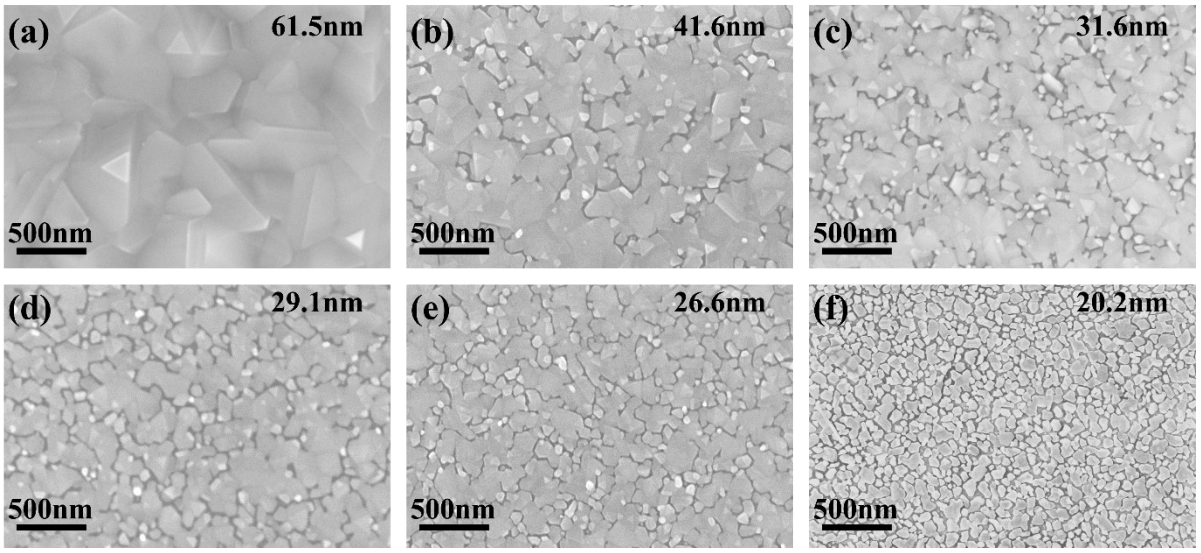

Fig. S4. FESEM images of Bi thin films with different thicknesses at a growth rate of 0.14 Å/min. (a) 61.5 nm; (b) 41.6 nm; (c) 31.6 nm; (d) 29.1 nm; (e) 26.6 nm; (f) 20.2 nm.

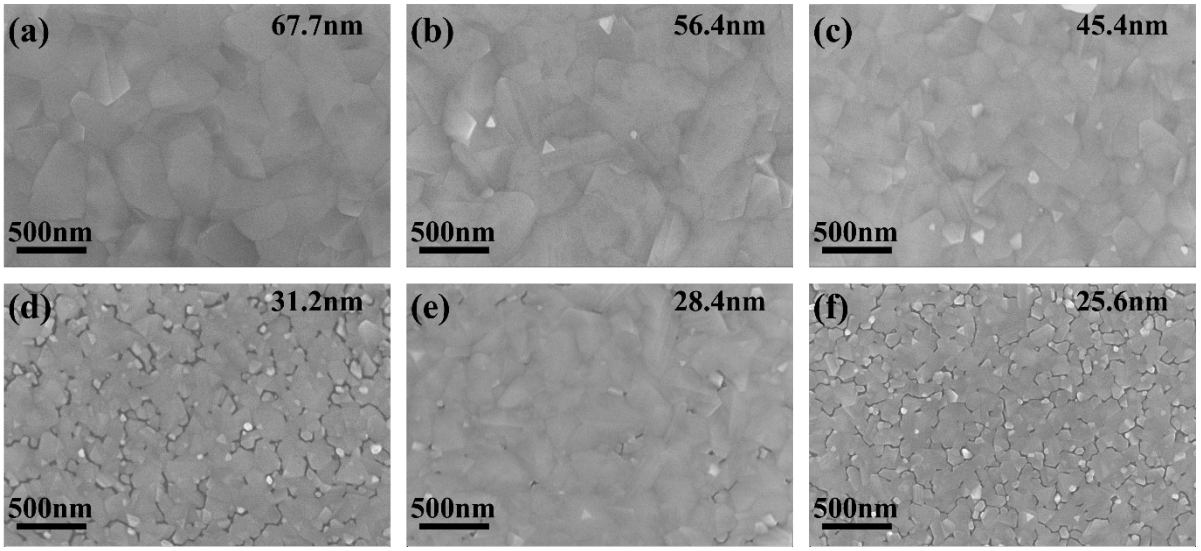

Fig. S5. FESEM images of Bi thin films with different thicknesses at a growth rate of 0.47 Å/min. (a) 67.7 nm; (b) 56.4 nm; (c) 45.4 nm; (d) 31.2 nm; (e) 28.4 nm; (f) 25.6 nm.

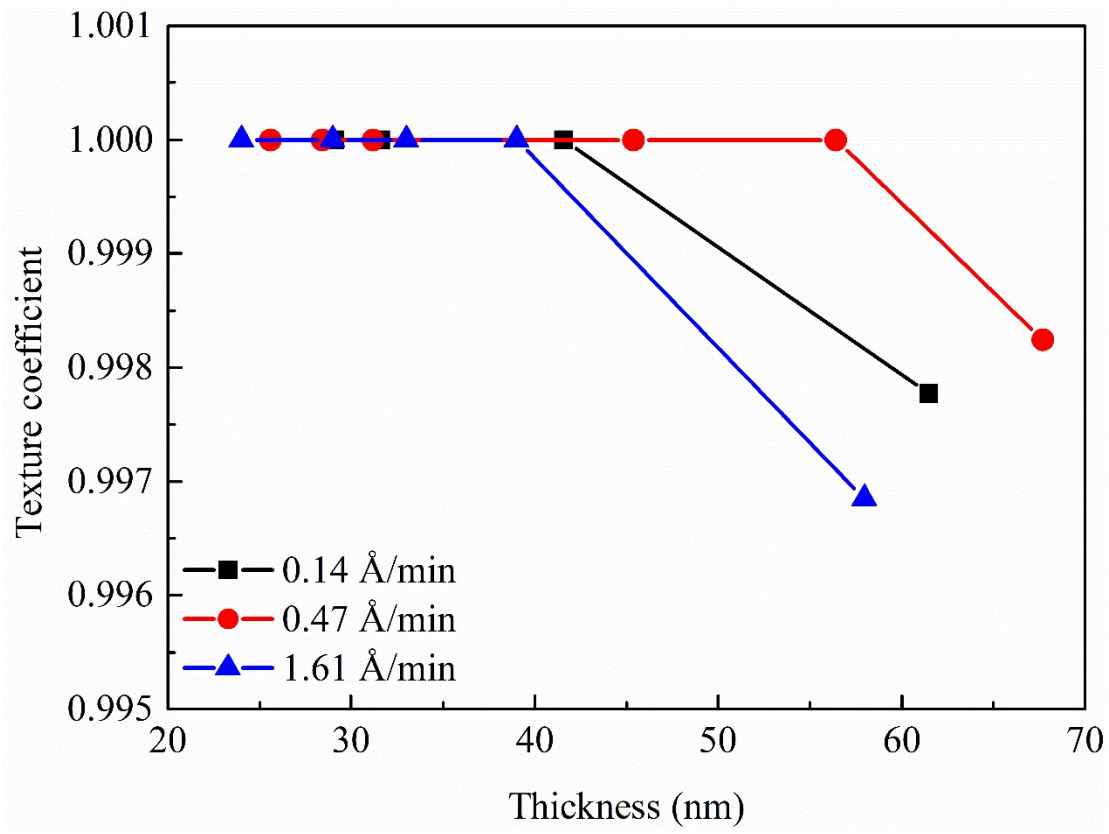

Fig. S6. The texture coefficient of Bi thin films at different growth rate.

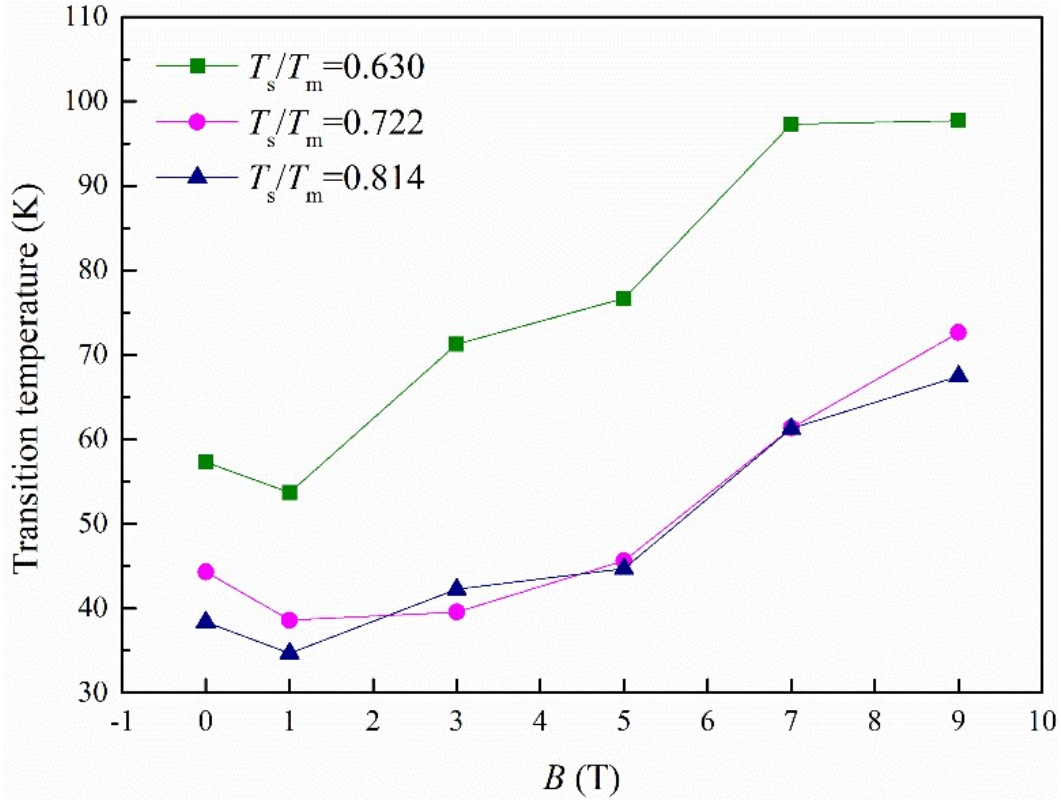

Fig. S7. Metal-insulator transition temperature curves under the fixed magnetic field.

Table 1 Sample parameters

Film	T_s (K)	T_m (K)	T_s/T_m	Deposition time (min)	Growth rate (Å/min)	Thickness (nm)	Out-plane grain size (nm)	Root mean square surface roughness* (nm)
1	291.15	544.45	0.535	180	-	~35	27.5	~12.2
2	343.15	544.45	0.630	180	-	~35	32.1	~4.2
3	373.15	544.45	0.685	180	-	~35	32.3	~2.1
4	383.15	544.45	0.704	180	-	~35	28.9	~11.9
5	393.15	544.45	0.722	180	-	~35	29.0	~7.4
6	423.15	544.45	0.777	180	-	~35	35.4	~8.2
7	343.15	544.45	0.630	170	~1.61	29	24.9	~2.5
8	343.15	544.45	0.630	210	~1.61	33	28.1	~7.9
9	343.15	544.45	0.630	240	~1.61	39	30.9	~6.5
10	343.15	544.45	0.630	360	~1.61	58	46.4	~10.5
11	343.15	544.45	0.630	480	~1.61	77	50.6	~12.5
12	343.15	544.45	0.630	1200	~1.61	193	67.1	~10.5
13	343.15	544.45	0.630	4320	~0.14	61.5	45.5	~8.4
14	343.15	544.45	0.630	2880	~0.14	41.6	33.4	~3.2
15	343.15	544.45	0.630	2160	~0.14	31.6	35.5	~5.1
16	343.15	544.45	0.630	1980	~0.14	29.1	25.3	~5.4
17	343.15	544.45	0.630	1880	~0.14	26.6	31.5	~7.7
18	343.15	544.45	0.630	1440	~0.14	20.2	27.5	~5.2
19	343.15	544.45	0.630	1440	~0.47	67.7	45.3	~3.8
20	343.15	544.45	0.630	1200	~0.47	56.4	39.5	~3.6
21	343.15	544.45	0.630	960	~0.47	45.4	31.8	~3.5
22	343.15	544.45	0.630	660	~0.47	31.2	25.1	~4.1
23	343.15	544.45	0.630	600	~0.47	28.4	25.8	~3.7
24	343.15	544.45	0.630	540	~0.47	25.6	21.8	~4.9

*Root mean square surface roughness (area size range: 2 μm × 2 μm)