

Supporting Information File

**Wet-chemical Synthesis of different Bismuth Telluride Nanoparticles using Metal
organic Precursors - *Single Source* vs. *Dual Source* Approach**

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Content

Fig. S1: DSC of BiEt_3

Fig. S2: DSC of Et_2Te

Fig. S3: DSC of $(\text{Et}_2\text{Bi})_2\text{Te}$ **1**

Fig. S4: DSC of Et_2BiTeEt **2**

Fig. S5: ^1H NMR study of the formation of **2**

Fig. S6: Temperature-dependent ^1H NMR study of the thermal decomposition of **2**

Fig. S7: ^1H NMR study of the reaction of **4** and $\text{Te}(\text{SiEt}_3)_2$

Fig. S8: ^1H NMR study of the reaction of **5** and $\text{Te}(\text{SiEt}_3)_2$

Fig. S9: ^1H NMR study of the reaction of **6** and $\text{Te}(\text{SiEt}_3)_2$

Fig. S10: Rietveld refinement of Bi_4Te_3

Fig. S11: Rietveld refinement of Bi_2Te_3

Fig. S12: Rietveld refinement of Bi_4Te_3

Fig. S13: Rietveld refinement of BiTe

Fig. S14: SAED pattern of Bi_4Te_3 nanoparticles

Fig. S15: SAED pattern of Bi_4Te_3 nanoparticles

Fig. S16: SAED pattern of Bi_4Te_3 nanoparticles

Fig. S17: SEM picture of Bi_2Te_3 nanoparticles

Fig. S18: PXRD of the decomposition of **1** in DIPB for 15 h, showing Bi_4Te_3 (black) and elemental Bi (red) as second phase.

Fig. S19: PXRD of the decomposition of **2** in OA for 15 h, showing elemental Bi as second phase.

Fig. S1: DSC of BiEt_3

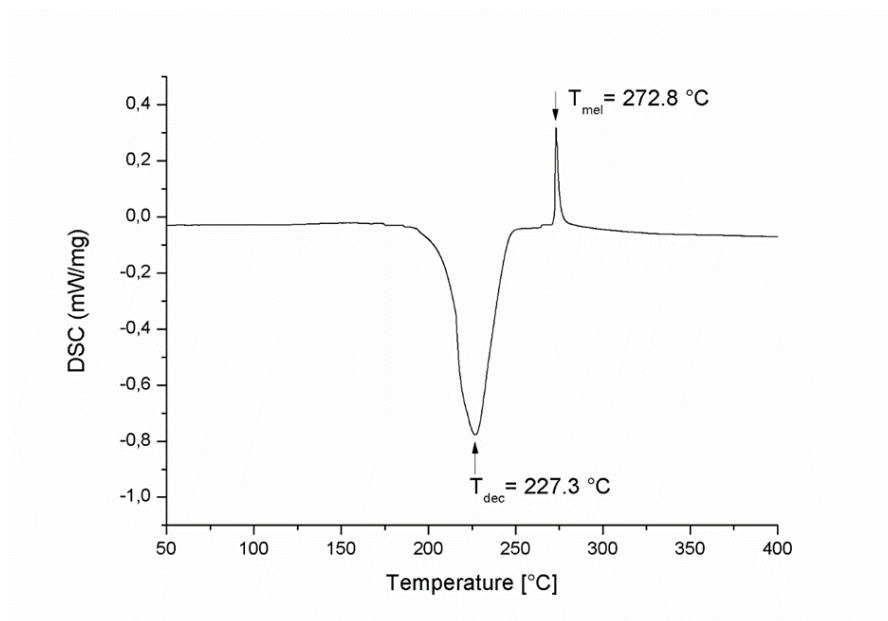


Fig. S2: DSC of Et_2Te

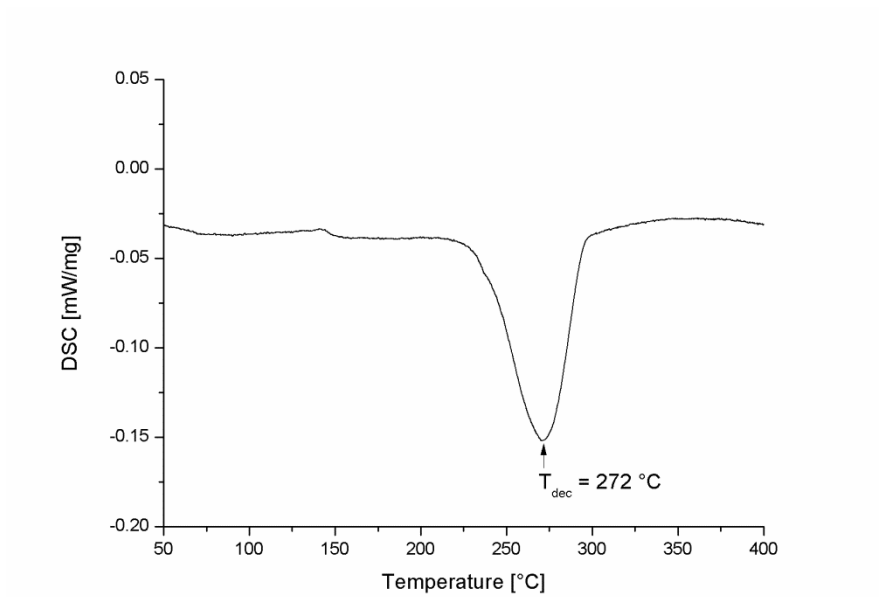


Fig. S3: DSC of $(\text{Et}_2\text{Bi})_2\text{Te}$ **1**

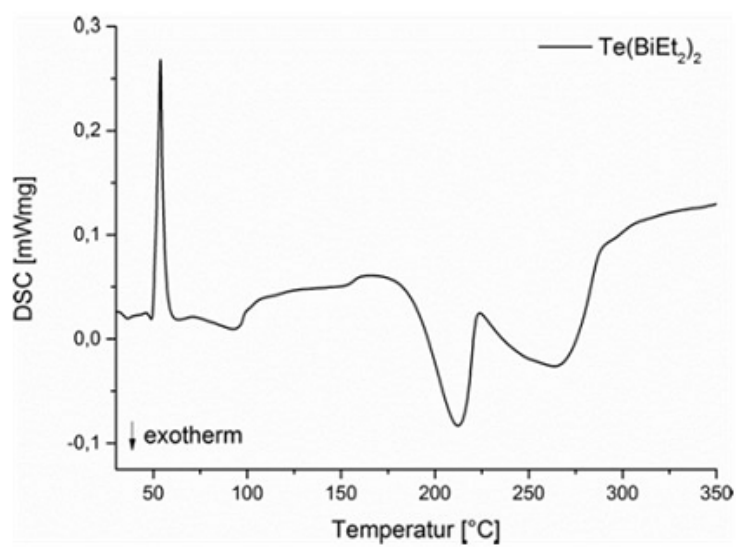


Fig. S4: DSC of Et_2BiTeEt **2**

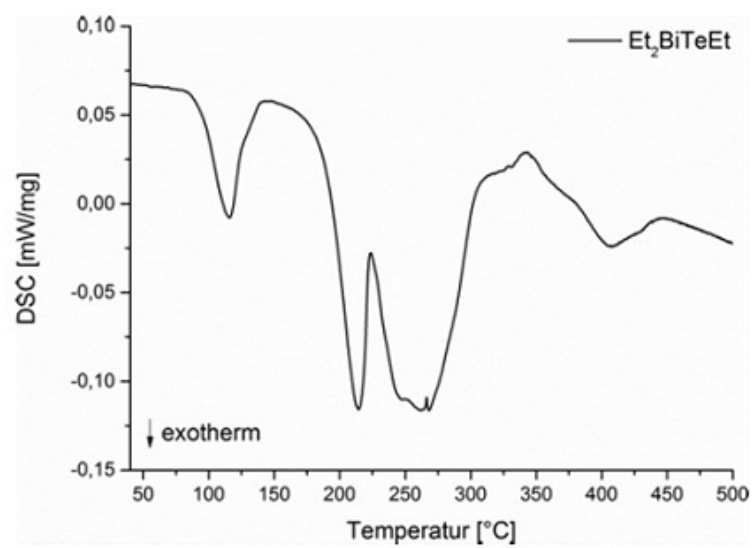


Fig. S5: ^1H NMR study of the formation of **2**

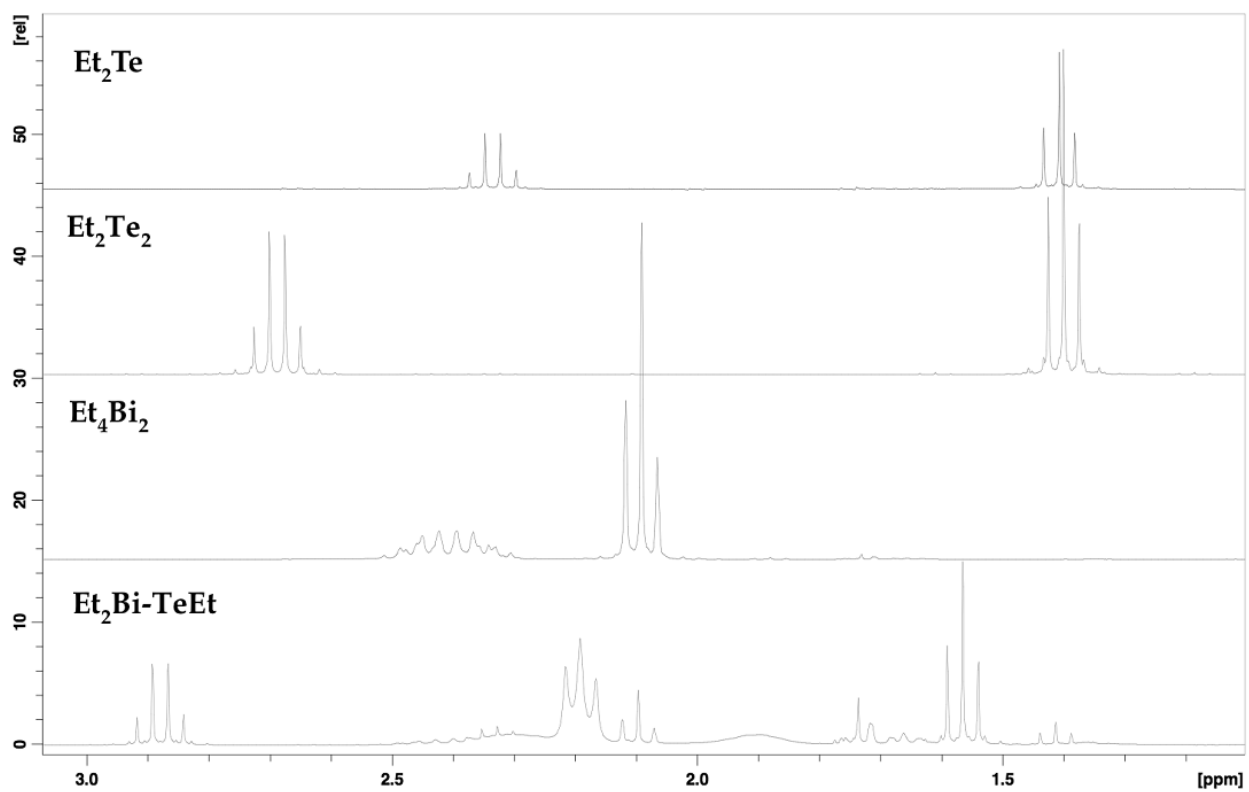


Fig. S6: Temperature-dependent ^1H NMR study of the thermal decomposition of **2**

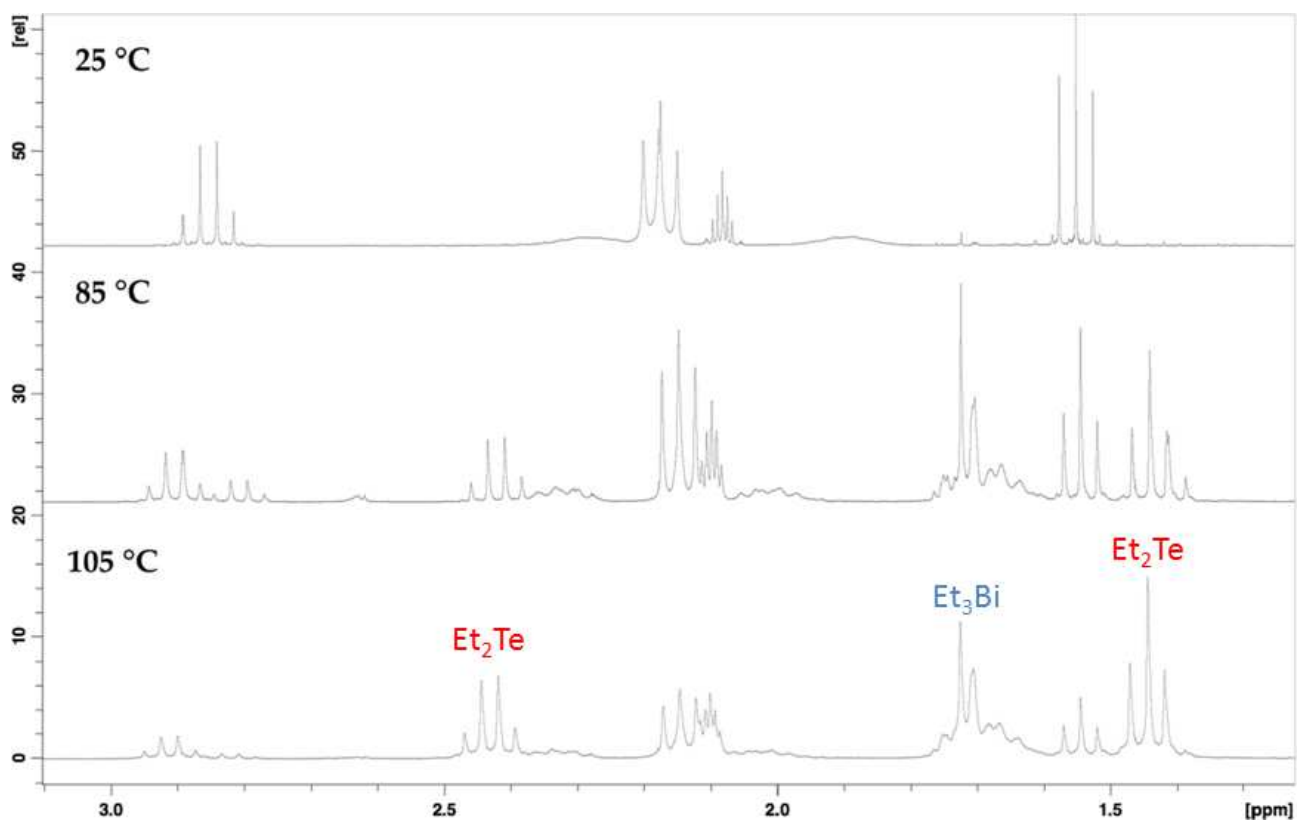


Fig. S7: ^1H NMR study of the reaction of **4** and $\text{Te}(\text{SiEt}_3)_2$

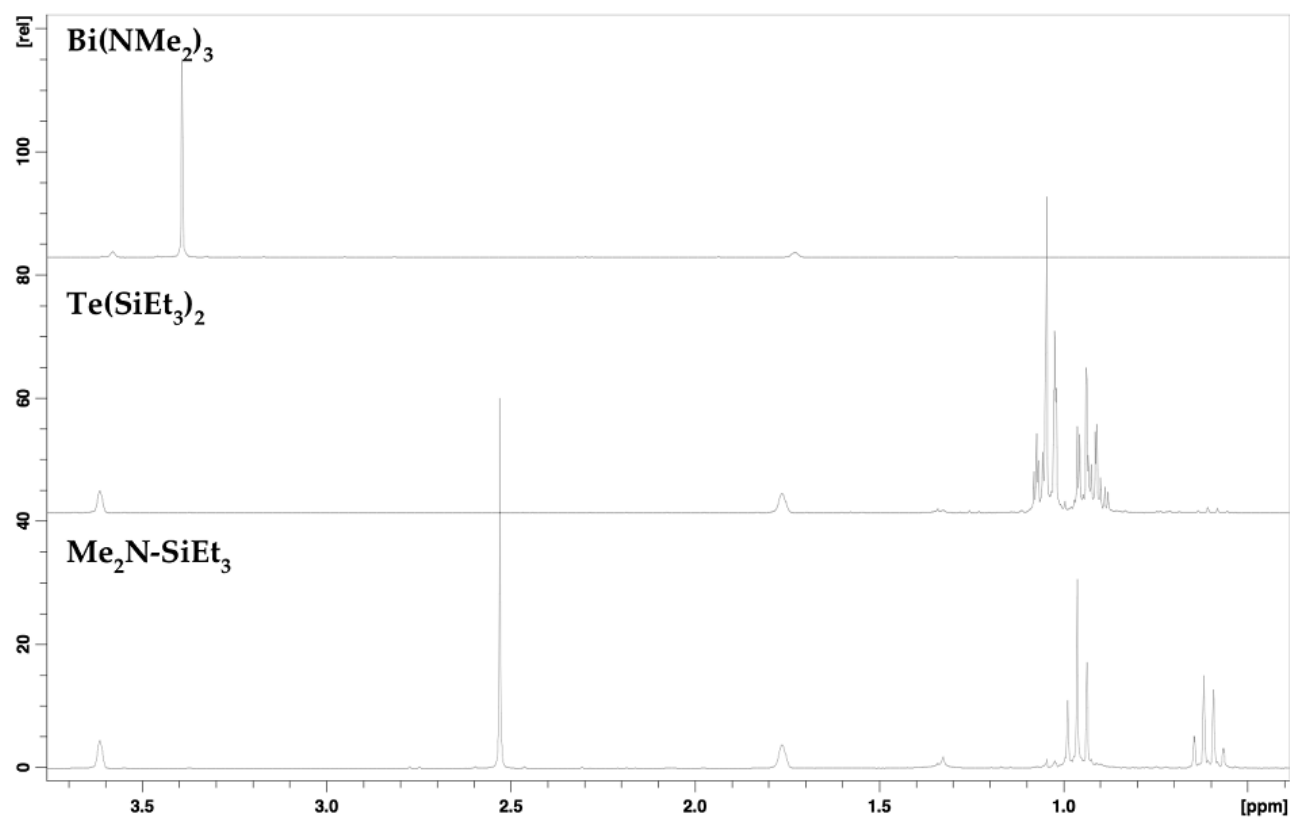


Fig. S8: ^1H NMR study of the reaction of **5** and $\text{Te}(\text{SiEt}_3)_2$

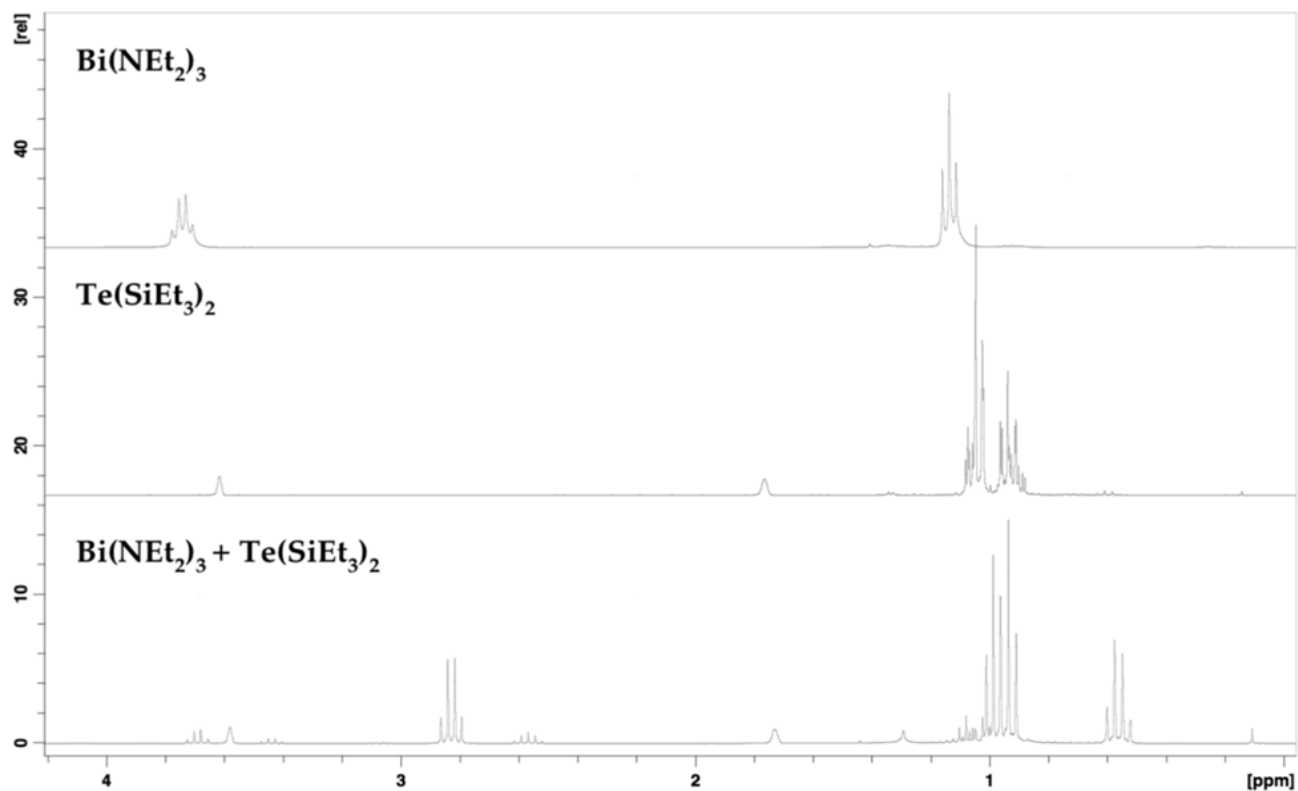


Fig. S9: ^1H NMR study of the reaction of **6** and $\text{Te}(\text{SiEt}_3)_2$

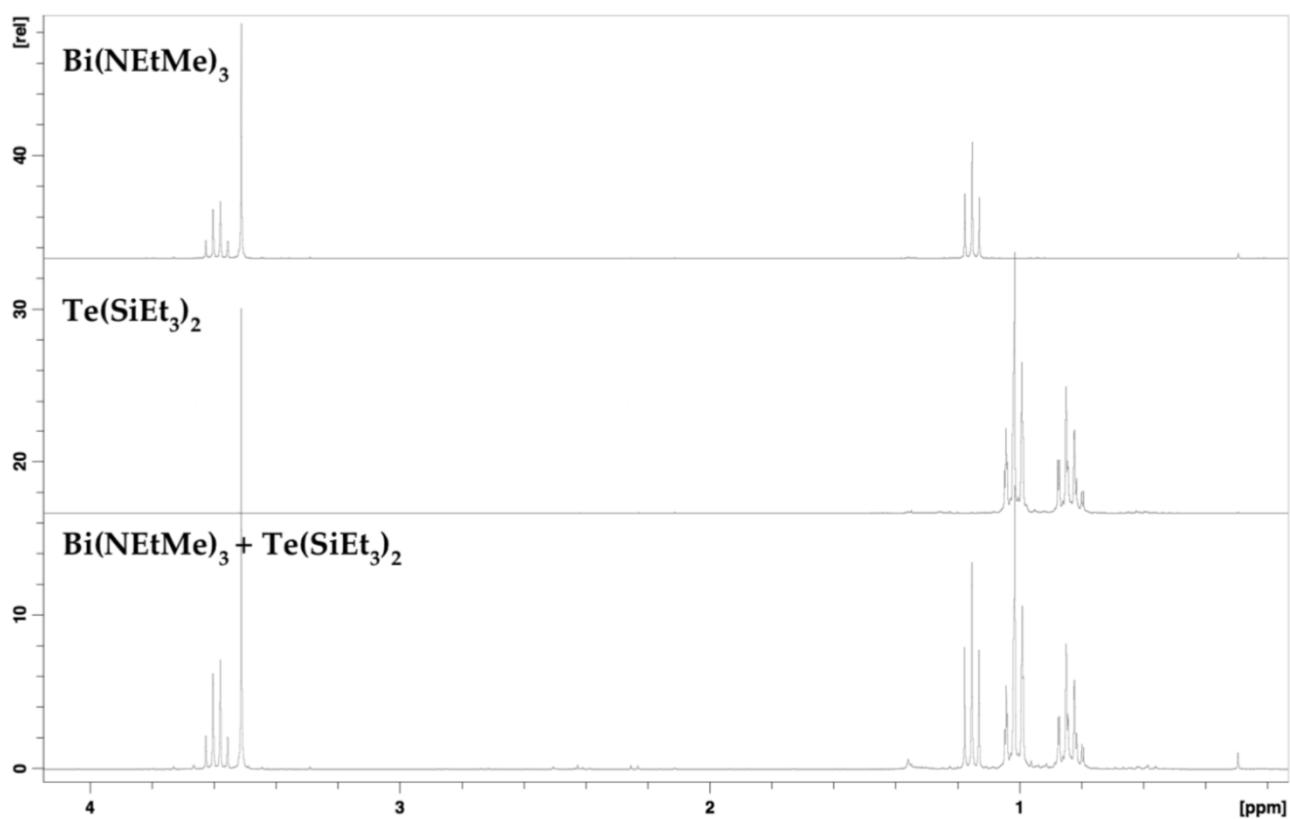


Fig. S10: Rietveld refinement of Bi_4Te_3 with $R_{\text{wp}} = 6.6\%$

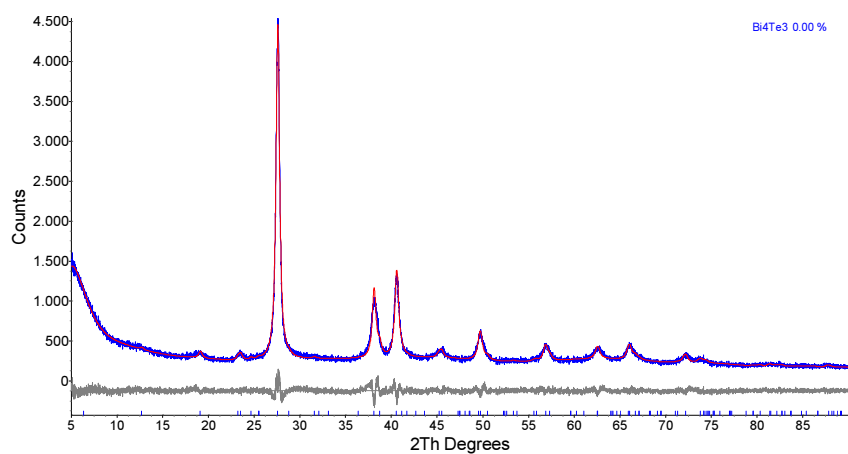


Fig. S11: Rietveld refinement of Bi_2Te_3 with $R_{\text{wp}} = 5.5 \%$

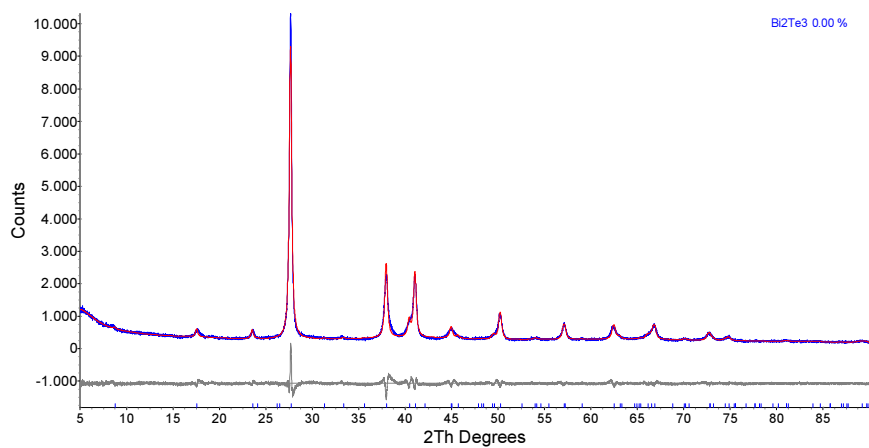


Fig. S12: Rietveld refinement of Bi_4Te_3 with $R_{\text{wp}} = 5.2 \%$

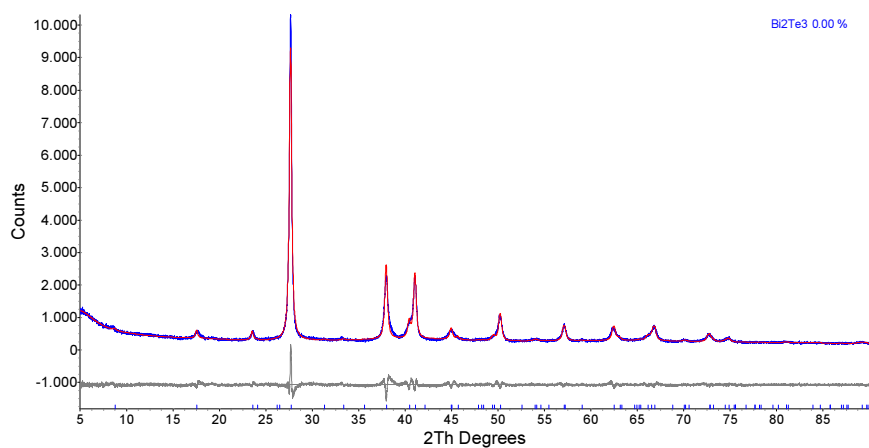


Fig. S13: Rietveld refinement of BiTe with $R_{\text{wp}} = 5.6 \%$

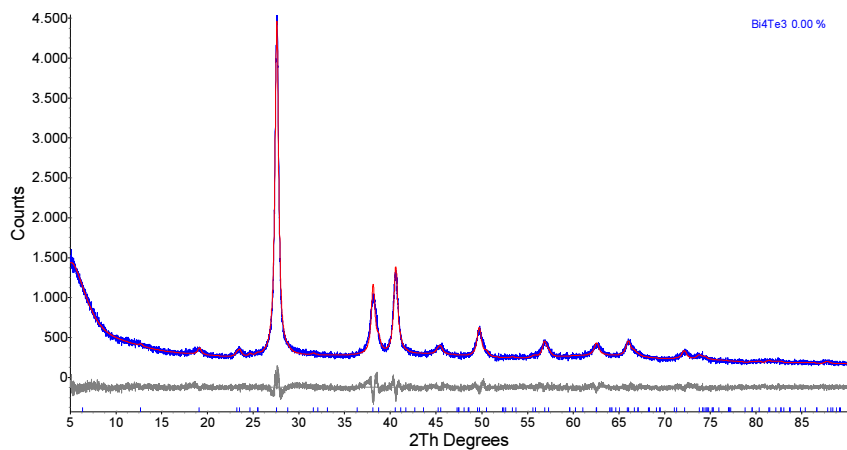
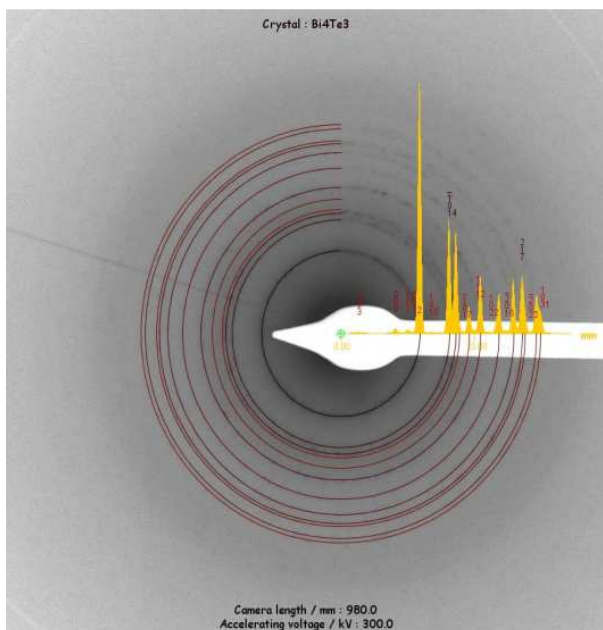


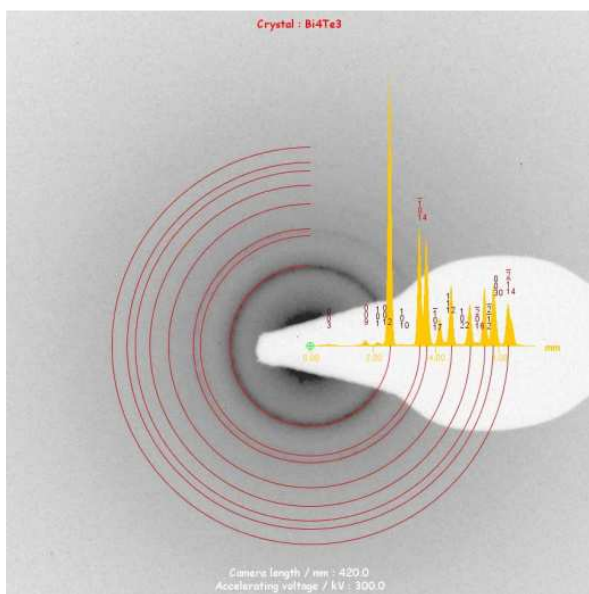
Fig. S14: SAED pattern of Bi_4Te_3 nanoparticles



SAED pattern: Philips/FEI CM300 UT FEG (300 KeV; camera length: 980 mm)

Simulation: jems^[1] structure data: Bi_4Te_3 (pilsenite) ICSD-30526^[2].

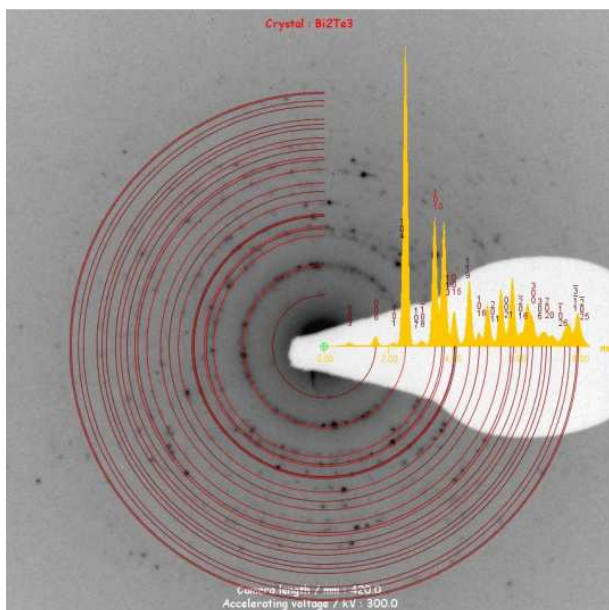
Fig. S15: SAED pattern of Bi_4Te_3 nanoparticles



SAED pattern: Philips/FEI CM30 T LaB₆ (300 KeV; camera length: 420 mm)

Simulation: jems^[1] structure data: Bi_4Te_3 (pilsenite) ICSD-30526^[2].

Fig. S16: SAED pattern of Bi_2Te_3 nanoparticles



SAED pattern: Philips/FEI CM30 T LaB₆ (300 KeV; camera length: 420 mm)

Simulation: jems^[1] structure data: Bi_2Te_3 ICSD-42546^[3]

Fig. S17: SEM picture of Bi_2Te_3 nanoparticles

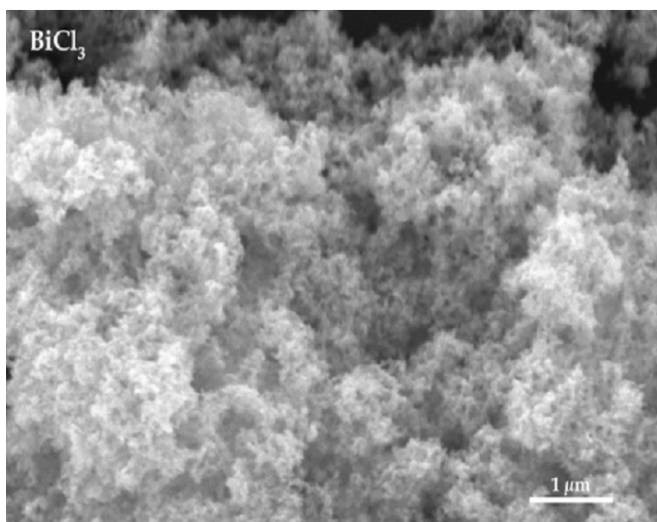


Fig. S18: PXRD of the decomposition of **1** in DIPB for 15 h, showing Bi_4Te_3 (black) and elemental Bi (red) as second phase.

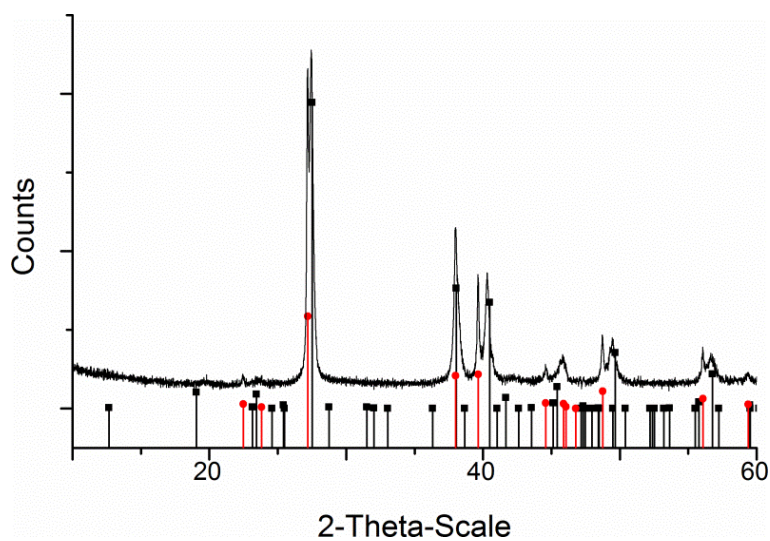
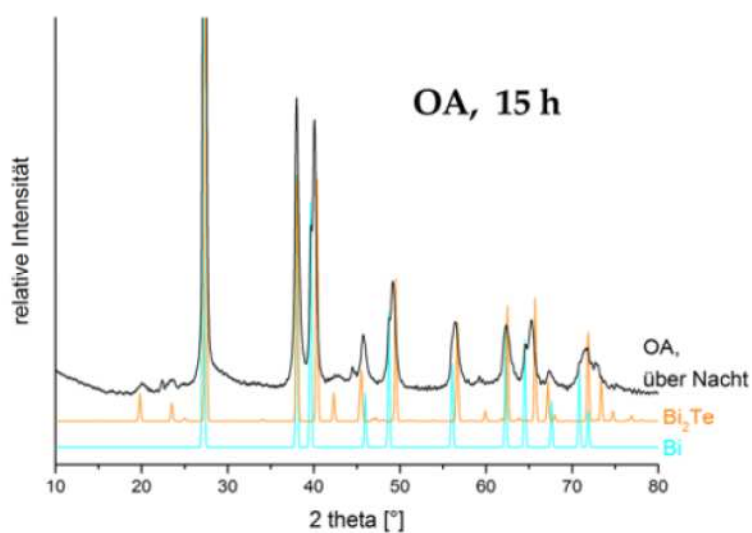


Fig. S19: PXRD of the decomposition of **2** in OA for 15 h, showing elemental Bi as second phase.



References

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- 2 K. Yamana, K. Kihara and T. Matsumoto, *Acta Cryst.* 1979, **B35**, 147.
- 3 S. Nakajima, *J. Phys. Chem. Solids* 1963, **24**, 479.