

Supporting Information

Green Synthesis of $\text{Ge}_{1-x}\text{Sn}_x$ Alloy Nanoparticles for Optoelectronic Applications

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Table S1. Crystallite size and lattice parameter of $\text{Ge}_{1-x}\text{Sn}_x$ alloy nanoparticles

Amount of Sn (%)	Crystallite size	Lattice Parameter (Å)
12.35	4.44 nm	5.76
15.05	5.17 nm	5.781
17.81	5.80 nm	5.794

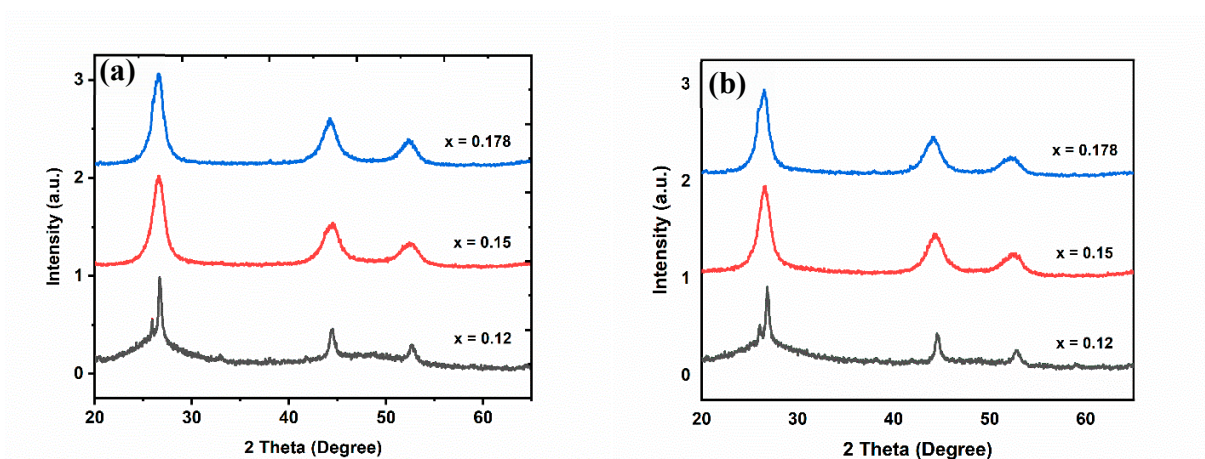


Figure S1. Powder XRD patterns of $\text{Ge}_{1-x}\text{Sn}_x$ nanoparticles after 4 months of storage under ambient conditions (a) Freshly prepared (b) After 4 months.

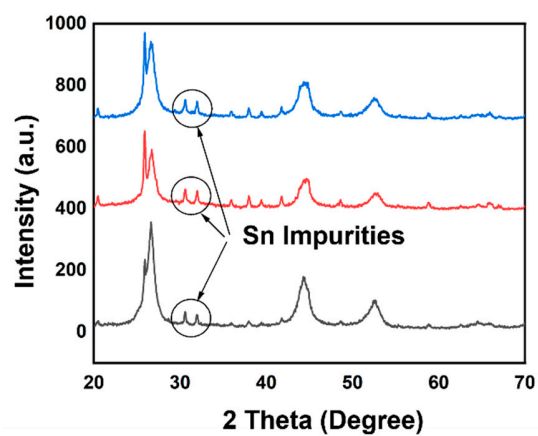


Figure S2. Powder XRD patterns of $\text{Ge}_{1-x}\text{Sn}_x$ nanoparticles with higher composition of Sn (20-30%) showing peaks of segregated Sn impurities.

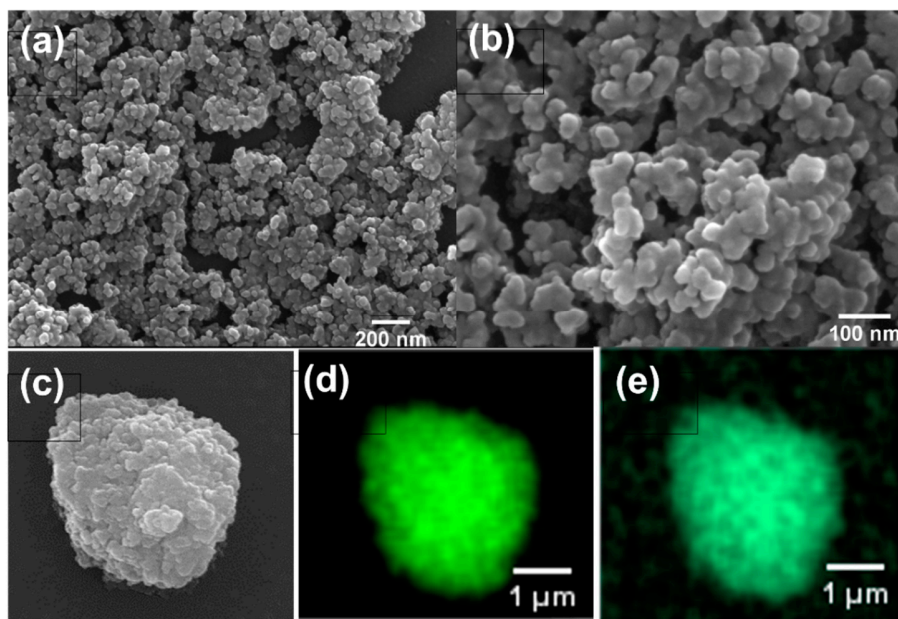


Figure S3. (a-c) SEM images of $\text{Ge}_{1-x}\text{Sn}_x$ nanoparticles ($x = 0.151$). (d and e) Ge and Sn SEM-EDX element mapping from the image c, showing that Ge and Sn are homogeneously dispersed through the alloy nanoparticles.

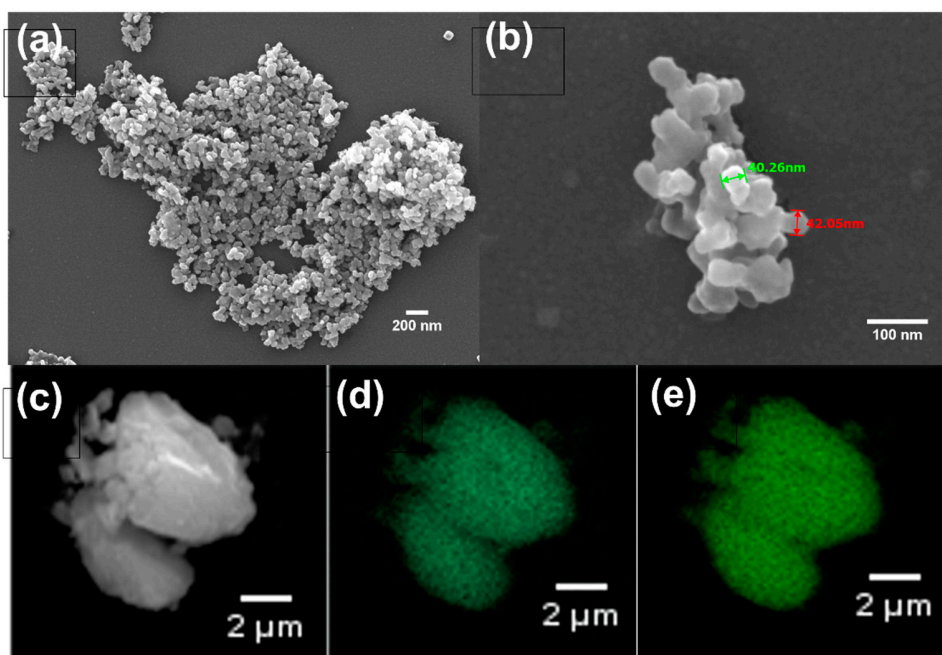


Figure S4. (a-c) SEM images of $\text{Ge}_{1-x}\text{Sn}_x$ nanoparticles ($x = 0.178$). (d and e) Ge and Sn SEM-EDX element mapping from the image c, showing that Ge and Sn are homogeneously dispersed through the alloy nanoparticles.

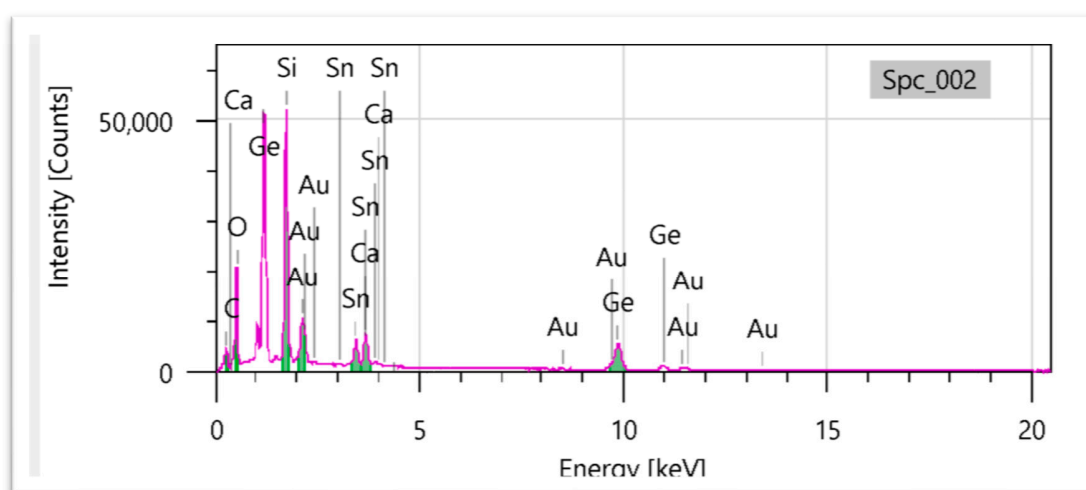


Figure S5. Representative SEM-EDS spectrum of $\text{Ge}_{0.85}\text{Sn}_{0.15}$ nanoparticles. C, Ca, O, and Si signals are originating from the substrate while Au signal stems from gold coating of the sample.