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Supporting Information

Nitrogen-mediated aligned growth of hexagonal BN films for reliable high-performance InSe transistors

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Table S1 Deposition conditions for the samples by HIPIMS.

Sample Name	Gas Flow Ratio of N_2/Ar (%)	Base Pressure (Torr)	Working Pressure (Torr)	Power Density (W/cm^2)	Thickness (nm)
A	5	3.96×10^{-6}	3.19×10^{-3}	26.13	502.05
B	10	1.99×10^{-6}	2.58×10^{-3}	24.30	488.76
C	15	2.76×10^{-6}	1.94×10^{-3}	21.56	486.61
D	20	2.72×10^{-6}	2.14×10^{-3}	25.22	546.77
E	40	2.83×10^{-6}	2.35×10^{-3}	24.77	437.81
F	60	2.54×10^{-6}	2.84×10^{-3}	25.78	552.91
G	85	2.70×10^{-6}	3.52×10^{-3}	24.12	647.53
H	100	2.07×10^{-6}	3.79×10^{-3}	26.22	446.93

Table S2 Summary of the peak positions of B 1s and N 1s for the samples and the difference between the peaks

Sample Name	Gas Flow Ratio of N_2/Ar (%)	Peak Identification	Binding Energy (from raw data) / eV	Difference in Binding Energy between B1s and N1s / eV	Binding Energy (fitted Gaussian curves) / eV	Difference in Binding Energy between B1s and N1s (fitted Gaussian curves) / eV
A	5	B1s N1s	190.5 397	206.5	190.3 397.1	206.8
B	10	B1s N1s	189.5 396.8	207.3	189.6 396.8	207.2
C	15	B1s N1s	189.6 397	207.4	189.8 396.9	207.1
D	20	B1s N1s	189.8 397	207.2	189.8 397	207.2
E	40	B1s N1s	189.9 397.16	207.3	189.9 397.1	207.2
F	60	B1s N1s	189.7 397.26	207.6	189.7 397.2	207.5
G	85	B1s N1s	189.8 397	207.2	189.8 397	207.2
H	100	B1s N1s	189.8 397	207.2	189.8 396.9	207.1

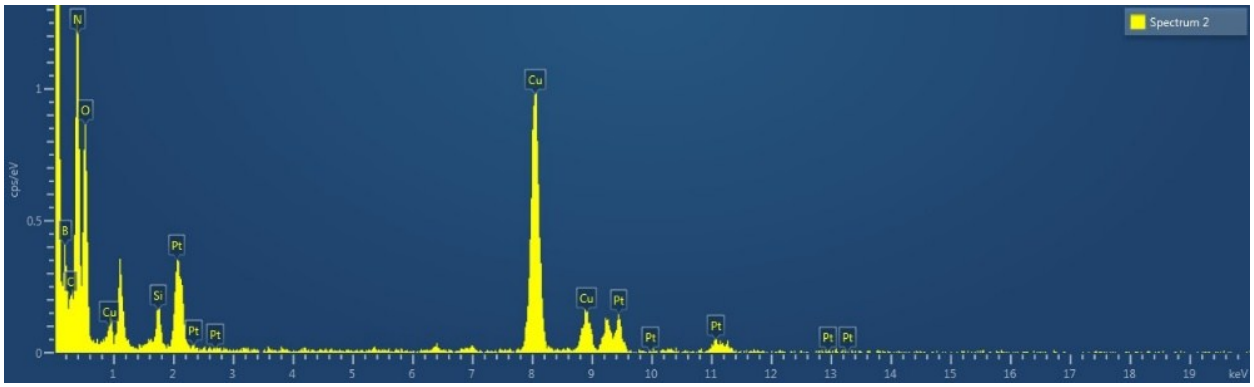

FIG. S1. EDS spectrum of h-BN thin films.

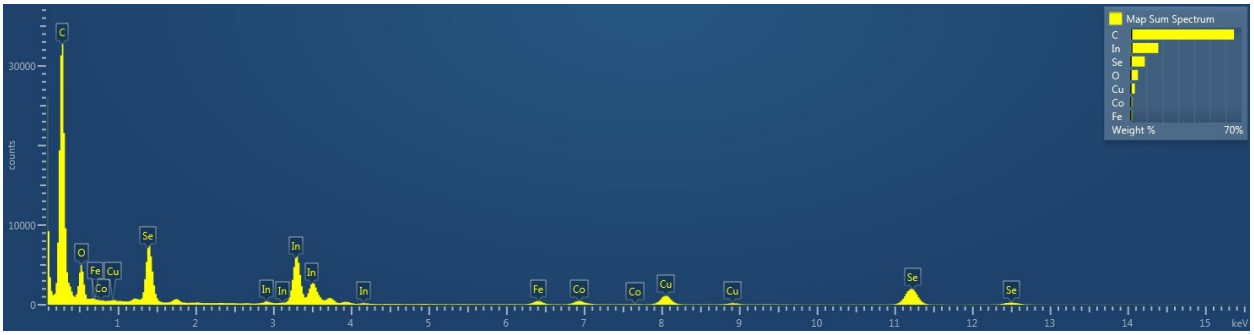

FIG. S2 EDS spectrum of InSe crystals.