Supplementary Information

**Electron transport in chalcogenide perovskite BaZrS$_3$**

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Figure S1. Power factor (PF) of BaZrS$_3$ against carrier concentration $n_\text{H}$ at different temperatures. Here, we note that the highest $PF$ values are achieved at $10^{21}$ cm$^{-3}$.

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Figure S2. Upper limit of the thermoelectric figure of merit ($ZT_e$) against carrier concentration at different temperatures for BaZrS$_3$. The highest $ZT_e$ values are achieved at $10^{15}$ cm$^{-3}$ to $10^{18}$ cm$^{-3}$ for $p$- and $n$-type doping at $T > 100$ K.

Figure S3. The variation of $ZT_e$ with temperature at different carrier concentrations of $1\times10^{17}$ cm$^{-3}$ to $9\times10^{17}$ cm$^{-3}$ for BaZrS$_3$. The highest $ZT_e$ values are obtained at a carrier concentration of $1\times10^{17}$ cm$^{-3}$ at all temperatures.
Figure S4. Transport properties against temperature for $n$-type doping at carrier concentrations of $10^{17}$ cm$^{-3}$ for BaZrS$_3$. Anisotropic effects are observed for $S$, $\sigma$ and $\kappa_e$. 