

Supporting information

Combinatorial and machine learning approaches for the analysis of $\text{Cu}_2\text{ZnGeSe}_4$: influence of the off-stoichiometry on defect formation and solar cell performance

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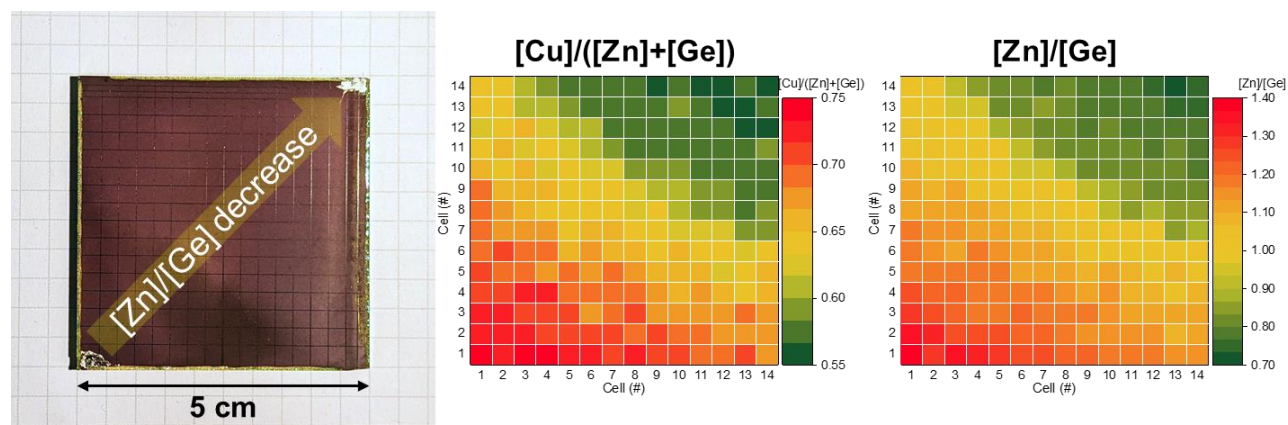


Figure S1. Picture (left) and mappings of XRF cations ratios (middle and right) of the combinatorial sample.

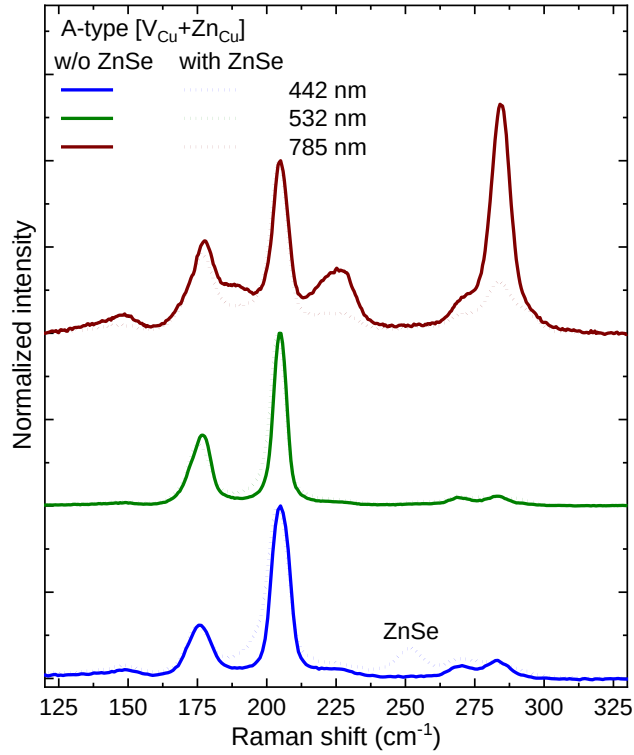


Figure S2. Raman spectra of the cells with compositions close to A-type off-stoichiometric line with (solid lines) and without (dotted lines) ZnSe secondary phase.

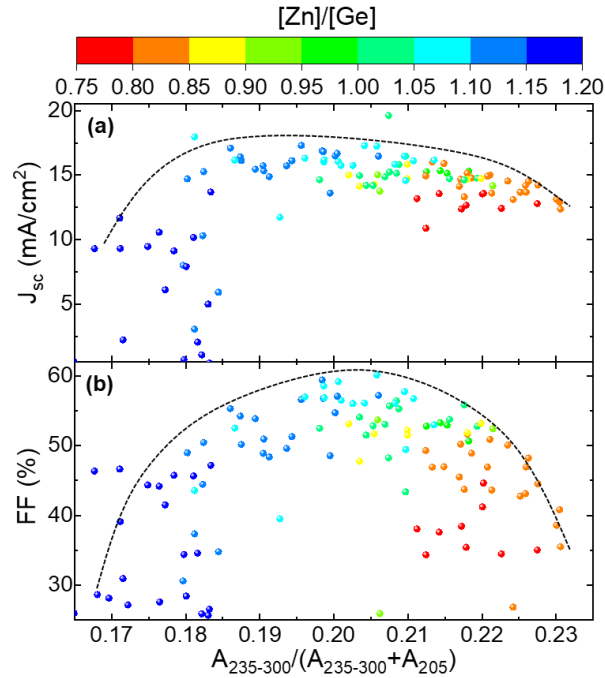


Figure S3. Dependence of (a) short circuit current and (b) fill factor of the cells on the relative integrated intensity of the Raman peaks in the range 235 – 300 cm^{-1} . The color scale corresponds to the relative integrated intensity of the Raman band at 176 cm^{-1} (see the main text for details).