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Crystal structure variations and opto-electronic properties in alkali doped kesterite-type semiconductors

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Off-stoichiometric kesterite-type $\text{Cu}_2\text{ZnSnSe}_4$ (CZTSe) is doped with Li, Na, K by two different methods. Adding dopants as chlorides directly during the solid-state synthesis from pure elements is compared to a post deposition approach. The samples are analysed by XRD with subsequent Rietveld refinements in combination with EMPA for spatially resolved compositional information and bandgap energy is characterized by DRIFTS.

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