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Correlation between the stoichiometry of Cs_xSb_y and its photoemission properties and oxidation response

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Alkali antimonide photocathodes are promising candidates for many high-brightness electron sources due to their low-emittance and high quantum efficiency. However, these materials require ultra-high vacuum (UHV) storage and transport to avoid oxidation, which affects their performance. In this proceeding, we report the synthesis of cesium antimonide cathodes with different stoichiometric ratios. These cathodes are compared in terms of photoemission properties (QE and spectral response) and crystalline structure. The results show that the change in the stoichiometry of the cesium antimonide leads not only to a different spectral response but also demonstrate that cathodes with a lower ratio Cs:Sb are highly resistant to oxygen which makes them great candidates for applications where UHV conditions are not obtainable.

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Footnotes

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