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Chemical robustness enhancement of negative electron affinity photocathodes through cesium-iodide deposition

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Photocathodes at Negative Electron Affinity (NEA), like GaAs and GaN, allow for efficient production of spin-polarized electrons. When activated to NEA with cesium and an oxidant, they are characterized by an extreme sensitivity to chemical poisoning, resulting in a short operational lifetime. In this work, we demonstrate that deposition of a cesium iodide (CsI) layer can be used to enhance the dark lifetime of both GaN and GaAs photocathodes activated with cesium. The mechanism behind this improvement is investigated using X-ray Photoelectron Spectroscopy (XPS) and Atomic Force Microscopy (AFM) techniques.

Footnotes

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