

Abstract Submitted
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The role of bond switches in light-induced defects in amorphous silicon LUCAS WAGNER, JEFFREY GROSSMAN, University of California, Berkeley — Amorphous silicon(a-Si) thin-film solar cells are promising materials for solar cells, but they suffer from the Staebler-Wronski effect, in which the efficiency degrades over the course of a few hours of light exposure. While there has been progress in mitigating this effect through sample preparation, there is still no clear microscopic explanation for the degradation. Using first principles density functional theory and highly accurate quantum Monte Carlo techniques, we investigate the simplest reaction in a-Si: a bond switch between two neighboring Si atoms. We find that these reactions can create defect states and can be light activated.

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