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A simple, solution-based technique to pattern copper nanowires BRANDON E. PALAFOX, VERONICA S. MEEKS, ANNA M. ZANIEWSKI, ROBERT J. NEMANICH , Arizona State University — Metal nanowires have a range of optoelectronic applications, including solar cells, photonic circuits, and nanoscale lasers. In this work, we present a technique to grow copper nanowires on a ferroelectric surface via a photochemical reaction. Copper acetylacetonate in a solution is placed on top of periodically poled lithium niobate and exposed to a UV source for 3 hours. The copper reduction is most favorable at the boundary between positively and negatively charged domain surfaces, resulting in copper nanowire formation. We find that the pattern of copper deposition on the surface is affected by the concentration of the solution, with optimal nanowire formation at a concentration of 1E-4 M. The wires vary in height from 50-65nm.

Brandon Palafox
Arizona State University

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