

Top-Down Approach for Fabricating Hematite Nanowire Arrays

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Abstract : Hematite (α -Fe₂O₃) has very good semiconducting properties with a band gap of 2.1 eV and is antiferromagnetic. Due to its electrochemical stability, low toxicity, wide abundance, and low-cost, hematite, it is a particularly attractive material for photoelectrochemical cells. Additionally, hematite has also found applications in gas sensing, field emission, heterogeneous catalysis, and lithium-ion battery electrodes. Here, we discovered a new universal top-down method for the synthesis of one-dimensional hematite nanowire arrays. Various shapes and lengths of hematite nanowire have been easily fabricated over large areas by sequential processes. The obtained hematite nanowire arrays are promising candidates as photoanodes in photoelectrochemical solar cells.

Keywords : hematite, lithography, nanowire, top-down process

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