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Self-Induced Voltage Oscillations during Anodic Etching of n-InP and Possible Applications for Three-Dimensional Microstructures

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Abstract

Voltage oscillations were observed during anodic etching of (100)-oriented n-InP substrates in an aqueous solution of HCl at high constant current density. Under certain conditions, the oscillations lead to a synchronous modulation of the diameters of pores on large areas of the samples which indicates a correlation between the phases of the oscillations in the pores. These self-induced diameter oscillations may be useful for three-dimensional microstructuring of n-InP and thus for the design and fabrication of new photonic materials.