

Abstract Submitted  
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**Increasing The Efficiency of Silicon Solar Cells via an Anti-reflecting Nano-porous Surface Layer** AHMET COSKUNER, AISHA GOKCE, OMER ALTUNAY, YANI SKARLATOS, OZHAN OZATAY, Bogazici Univ — Electrochemical etching of silicon in a controlled environment results in a porous surface that has many application areas from drug delivery to optoluminescent devices. There is vast interest in implementing porous silicon in silicon solar cells to increase light absorption and therefore the efficiency. Here we demonstrate successful formation of a nano-porous surface on mono-crystalline Si wafers as well as doped Si solar cells. Our results show that pre-cleaning and post-drying is crucial to acquire a smooth, non-cracked topography. We also find that under similar conditions, smaller pores in a denser arrangement and with shorter depths form in p-n junction type Si wafers compared to n-type or p-type Si. In ITO coated porous Si solar cells with Al back contacts, the measured efficiency increase is almost 50% of those without a porous surface. This is a promising result to further enhance the performance of Si solar cell devices.

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