**Title:** Boron-doped nanocrystalline silicon thin films for solar cells

**Author(s):** Fathi, E.²; Vygranenko, Y.¹,³; Vieira, M.¹,³; Sazonov, A.²

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**Abstract:** This article reports on the structural, electronic, and optical properties of boron-doped hydrogenated nanocrystalline silicon (nc-Si: H) thin films. The films were deposited by plasma-enhanced chemical vapour deposition (PECVD) at a substrate temperature of 150 degrees C. Crystalline volume fraction and dark conductivity of the films were determined as a function of trimethylboron-to-silane flow ratio. Optical constants of doped and undoped nc-Si: H were obtained from transmission and reflection spectra. By employing p(+) nc-Si: H as a window layer combined with a p' a-SiC buffer layer, a-Si: H-based p'-p-i-n solar cells on ZnO:Al-coated glass substrates were fabricated. Device characteristics were obtained from current-voltage and spectral-response measurements. (C) 2011 Elsevier B. V. All rights reserved.

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**Reprint Address:** Vygranenko, Y (reprint author), ISEL, Dept Elect Telecommun & Comp Engn,Rua Conselheiro Emídio Navarro 1, P-1959007 Lisbon, Portugal.

**Addresses:**
1. ISEL, Dept Elect Telecommun & Comp Engn, P-1959007 Lisbon, Portugal  
2. Univ Waterloo, Dept Elect & Comp Engn, Waterloo, ON N2L 3G1, Canada  
3. CTS UNINOVA, P-2829516 Caparica, Portugal

**E-mail Address:** yvygranenko@deetc.isel.pt

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