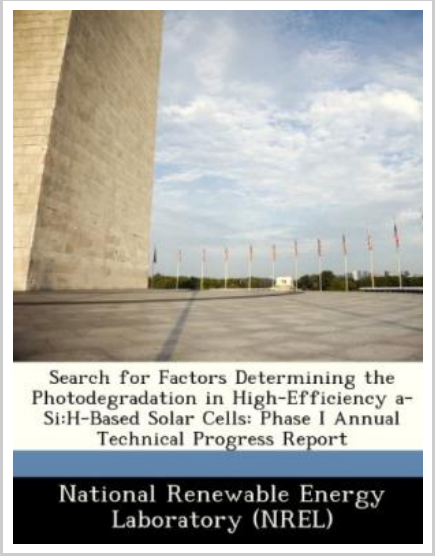

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Search for Factors Determining the Photodegradation in High-Efficiency A-Si: H-Based Solar Cells: Phase I Annual Technical Progress Report (Paperback)

By National Renewable Energy Laboratory (NREL)

Bibliogov, United States, 2012. Paperback. Book Condition: New. 246 x 189 mm. Language: English . Brand New Book ***** Print on Demand *****.This report describes studies on glow discharge (GD) and hot-wire a-Si-based samples by the University of North Carolina-Chapel Hill during Phase I. We have characterized H-bonding and its light-induced changes by using infrared (IR) and differential IR (DIR). For the less stable film, there is a simultaneous decrease 2040 cm-1 and increase 1880 cm-1; for the more-stable samples, the DIR near 2000 cm-1 increases upon light-soaking. Nuclear magnetic resonance (NMR) dipolar relaxation time T1D of the clustered H is slightly shorter, but the T1D of the isolated H is 4 times longer in hot-wire (HW) film than that in GD films. The results indicate that the local motion of the isolated H is much slower in HW compared to that in GD film. High-Temperature NMR results show a second narrow line (less than 1 kHz wide) as the temperature is raised. In stress measurements, it is clearly shown that HW films with lower hydrogen content show lower compression. A photoinduced increase of the compression on the order of 10-4 of the initial value upon light-soaking was found to...

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