



## Comprehensive Research on Stability of Amorphous Silicon and Alloy Materials and Devices

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 \*\*\*\*\*.In this report, we describe the work done to improve the material and device properties of a-Si: H and a-(Si, Ge): H alloys prepared using electron cyclotron resonance (ECR) plasma deposition and to understand the growth chemistry. Major results were obtained in the following areas: 1) Influence of plasma chemistry on properties and stability of a-Si: H single-junction solar cells; 2) Fabrication of good-quality tandem-junction cells. We made tandem-junction a-Si/a-Si cells with excellent voltages and fill factors using the H-ECR process; 3) Growth of high-quality a-(Si, Ge): H films using the ECR deposition process; 4) Fabrication of single-junction devices in a-(Si, Ge): H for diagnosing the material; and 5) Graded-gap cells in a-(Si, Ge): H. Good devices were produced using a graded-gap I-layer. In summary, the most important finding from our research has been that plasma chemistry plays a very important role in determining the properties of the materials, particularly the properties of the a-(Si, Ge): H alloy system. Even in a-Si: H, plasma chemistry plays a role in determining stability. This result suggests that by deliberately changing...

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