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Changes of Electric conductivity of Amorphous Silicon by Argon Radical Annealing

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The stability of hydrogenated amorphous silicon (a-Si:H) films under the light soaking are very important since the applications of a-Si:H films are solar cells, color sensors, photosensors, and thin film transistors(TFTs). We found the changes of the electric conductivity and the conductivity activation energy (E_a) of a-Si:H films by argon radical annealing. The deposition rate of a-Si:H films depends on the argon radical annealing time. The optical band gap and the hydrogen contents in the a-Si:H films are changes along the argon radical annealing time. We will discuss the microscopic processes of argon radical annealing in a-Si:H films.