

## Direct Deposition of microcrystalline Si Films at Low Temperatures (<200 °C) by Catalytic CVD

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Microcrystalline silicon (mc-Si) thin films have been receiving a great deal of attention as a material for solar cells or thin films transistors having higher carrier mobility than that of the amorphous silicon. Mc-Si thin films which are prepared at a low temperature (<200 °C) will be desirable for electronic devices on flexible substrate. Mc-Si thin films were deposited by catalytic chemical vapor deposition(Cat-CVD/HWCVD) without a post process using the laser or furnace.

In order to mc-Si films of a high deposition rate and a high crystalline volume fraction at low substrate temperature, we controlled hydrogen dilution ratio, gas flow rate, catalyst temperature and chamber pressure. We observed that the deposition rate increased with the gas flow rate and the chamber pressure and the crystalline volume fraction increased with the catalyst temperature and the hydrogen dilution ratio. In the optimum condition, we achieved simultaneously a crystalline volume fraction as high as 66 % and a deposition rate as high as 300 Å/min at substrate temperature 180 °C.