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Synthesis of microcrystalline SiC film at low temperature ($\leq$ 600°C) by hydrogen plasma chemical transport at sub atmospheric pressure[1] HIROMASA OHMI, Department of Precision Science & Technology, Osaka University, TETSUYA MORI, TAKAHIRO HORI, HIROAKI KAKIUCHI, KIYOSHI YASUTAKE — This paper demonstrates that the μc-SiC film for solar cell application could be prepared by plasma enhanced chemical transport technique at sub-atmospheric pressure. The SiC film was synthesized by using graphite and Si solid sources. The hydrogen plasma was generated in the gap ($\sim$1mm) between the solid source and substrate at 200 Torr. The influence of the substrate temperature (T_{sub}) on the film properties was investigated. Based on the structural analysis, it became clear that the μc-3C-SiC film could be prepared at low T_{sub} (100 - 600°C). The electric conductivity of the SiC film increased with increasing T_{sub} and reached to 1.68S/cm for the SiC film prepared at 600°C. The n-type 3C-SiC film was prepared on the p-type Si to fabricate a pn diode. The current –voltage characteristic of the pn diode showed good rectifying characteristics. Furthermore, photovoltaic characteristic of the prepared diode was checked up.

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