

Abstract Submitted
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Study of O₃-TEOS SiO₂ Cladding for Silicon Photonics Devices KEIZO KINOSHITA, PETRA, TSUYOSHI HORIKAWA, PETRA, AIST, DAISUKE SHIMURA, HIROYUKI TAKAHASHI, TOHRU MOGAMI, PETRA — Silicon Photonics (SiPh) is a promising technology for large-capacity and wide-band data communications for the distance from millimeter to 100 meters which corresponded well to data center applications. This paper describes about O₃-TEOS SiO₂ film developments as an upper cladding over Si waveguide core fabricated on silicon-on-insulator wafers. It was compared with a plasma-enhanced chemical-vapor-deposition (PE-CVD) SiO₂ film used widely as the cladding material. The O₃-TEOS SiO₂ showed very high gap-fill characteristic at parallel arrangement of two waveguides. However, its propagation loss was 1.83 dB/cm which is three times larger than that of the conventional PE-CVD SiO₂ cladding. Chemical analyses by FT-IR and TDS for these two types of cladding films were carried out to clarify this reason. It was clearly shown that remained water within the O₃-TEOS SiO₂ cladding could cause the larger propagation loss by O-H stretching absorption. The water exclusion procedure should be developed to apply O₃-TEOS SiO₂ for the cladding materials. This work was supported by NEDO.

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