Silicon films deposited on flexible substrate by hot-wire chemical-vapor deposition

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ABSTRACT

Silicon film was deposited on a novel flexible polymer, cyclic olefin copolymer (COC), by using hot-wire chemical-vapor deposition at a low substrate temperature and increasing hydrogen-dilution ratios (DH: 0%–95%). The crystallinity of the silicon film coated on a COC substrate increased, changing from amorphous to microcrystalline, accompanying the rising hydrogen-dilution ratio. The surface morphology of the deposited silicon film varied according to the hydrogen-dilution ratio, with roughness values of the silicon film increasing from 4.20 to 6.51 nm. This study examined the effect of hydrogen-dilution ratios on the crystallinity, surface roughness, and optical-absorption properties of silicon films.

Keywords: Amorphous materials, Hot-wire deposition, Silicon film

REFERENCES