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Dielectric property and interfacial polarization of polymer-derived amorphous silicon carbonitride

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Abstract

The dielectric behavior of polymer-derived amorphous silicon carbonitride was investigated. The material exhibited an interfacial polarization. Although such a polarization exhibited a sharp decrease in the dielectric constant with frequency, the loss peak from this mechanism was not clearly observed because DC conduction dominated the dielectric loss. On the other hand, a sharp increase in the dielectric constant and loss peak were observed at 350 °C at 1 kHz, indicating that the interfacial polarization enhanced at elevated temperatures. This interfacial polarization can be attributed to the migration and accumulation of charge carriers at the interface of matrix and free-carbon phases.

Keywords:

Dielectric relaxation; Silicon carbonitride; Impedance spectroscopy

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