PRODUCTS OF FREON PLASMAS

by

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ABSTRACT

The freons are widely used as plasma etchants for silicon, SiO_2, silicon nitride and other substrates in the semiconductor industry. Much interest has been focussed on etching characteristics: selectivity, anisotropy and rate. However, a wide variety of products are formed by combination, abstraction and oxidation reactions in freon plasmas.

The products of CF_4, C_2F_6, CF_3, Cl, CF_3Br and certain other freons have been studied as a function of flow rate and power in 14m Hz radiofrequency discharges. Several reactor geometries were used. When oxygen, chlorine or silicon are concomitantly added in the plasma or downstream of the afterglow, an even wider array of products is observed. The nature of these products and some mechanisms describing the syntheses will be discussed.

Compounds: CF_4, C_2F_6, CF_3Cl, CF_3Br, Si, SiO_2

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