Mass Spectromic Studies of Fluorocarbon Glow Discharges

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The positive ions and neutral molecules which are extracted from various fluorocarbon rf glow discharges have been monitored mass spectrometrically concurrent with the deposition of polymer films adjacent to the extraction orifice. Studies of this type have been carried out as a function of C_2F_4 flow rate at constant pressure, and for several other fluorocarbon monomers also at constant pressure but only at one fixed flow rate. For both the positive ions and the neutral species, a correlation between the relative intensity of a certain group of oligomers and the polymer film deposition rate has been observed for booth parameters studied (flow rate and monomer gas). The carbon-to-fluorine ration of the oligomers for which this correlation holds is close to one whereas for those species which do not correlate significantly with the deposition rate the carbon-to-fluorine ratio is approximately 0,5. A description of the measurements will be given and the significance of the observed correlation will be discussed.

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