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Plasma diagnostics of cyclopropylamine/argon plasma polymerization process

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Cyclopropylamine, an isomer of widely known allylamine, is a promising candidate for deposition of amine-rich coatings thanks to the low toxicity, excellent stability of prepared coatings and relatively high content of amine groups. However, for further optimization and up-scaling of the process a deeper understanding is crucial. The presented work investigates some fundamental aspects of the deposition process by plasma diagnostics and discusses it within scope of the macroscopic kinetics. The gas phase processes are investigated by mass spectrometry and optical emission spectroscopy, whereas surface processes, mainly the ion bombardment, are studied by retarding field energy analyzer. This work provides insight into the correlation between the inner plasma parameters obtained from diagnostics and properties of the thin film characterized namely by X-ray photoelectron spectroscopy and infrared spectroscopy. Finally, the link between the external parameters and desired thin film properties can be established.

Keywords

cyclopropylamine
plasma polymerization
plasma diagnostics
amine-rich thin films