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VIRTUAL
MEETING

#PLATH00110

PROC / Process control (including plasma diagnostics, plasma modelling)

Mass spectrometric investigations in a Ar/CH₄ radio frequency low pressure discharge

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Abstract content

As with many other hydrocarbon precursors nanoparticles can be formed in low temperature plasmas from methane. It has been documented, compared to some other gases, that relatively high power densities are required [1]. It is, however, possible to form nano dust only from an argon plasma in a dirty chamber, prior conditioned with a methane plasma. In this work we study by means of mass spectrometry the gas and ion composition of a Ar/CH₄ plasma in a low temperature RF plasma. In particular, the influence of the wall and electrode condition is investigated by the comparison of the respective spectra. Additionally, with a simple rate equation model the total dissociation rate of methane is calculated for different plasma parameters.

Thanks/Acknowledgement

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References

[1] J. Berndt et al., Dust particle formation in low pressure Ar/CH₄ and Ar/C₂H₂ discharges used for thin film deposition, *Vacuum* 71 (2003) 377–390