

TEMPERATURE OF MICRO-PARTICLES IN A LOW-PRESSURE RF-DISCHARGE

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The surface temperature of substrates is a fundamental parameter in technical plasmas used for deposition of layers or modification of surface properties. It is determined by different energy fluxes between the plasma and the substrate, whose composition is addicted to physical and chemical reaction rates¹. In this work, micro-disperse phosphor particles are applied as temperature probes, feasible for the determination of the particle temperature by means of optical techniques². These particles are confined in the sheath of a capacitively coupled rf-plasma, and their externally excited luminescence is recorded spectroscopically and evaluated by a comparison to calibration measurements.

Results for the particle temperatures in different plasma conditions in Argon are presented, as well as in mixtures with molecular gases. The particle temperatures are discussed with respect to the particular plasma-parameters and appearing surface reactions.

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