

**AN EXPERIMENTAL INVESTIGATION OF LOW TEMPERATURE
PLASMA STERILIZATION, TREATMENT, AND
POLYMERIZATION PROCESSES**

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ABSTRACT

This dissertation focuses on investigation of low temperature plasma processes. Different types of glow discharges including atmospheric pressure direct current (DC) plasma, low-pressure DC plasma, and low-pressure radio frequency (RF) plasma are investigated with respect to their suitability for surface sterilization, modification, and polymerization. It was found that atmospheric pressure plasma is very effective in destruction of organisms and surface modification of conventional polymers. The role of plasma polymerization and its relevance to aging phenomena encountered in gas detectors were investigated using low-pressure DC plasma systems. Research effort was also given to the study of RF plasma deposition of protective coating layer to polymeric materials.