

434j Study of Non-Thermal Plasma for Liquid Foods Pasteurization

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Non-thermal processes for food preservation arise from consumers' demand for high quality, minimally processed foods with fresh characteristics and no additives. Non-thermal plasma (NTP) is electrically energized matter, which generate highly reactive species including gas molecules, charged particles in the form of positive ions, negative ions, free radicals and electrons, and quanta of electromagnetic radiation (photons) at near-room temperature. They can kill microorganisms in contact. Therefore, NTP technologies could be used for non-thermal pasteurization and sterilization of foods and biological fluids.

Our objective is to investigate the possibility of using non thermal plasma to pasteurize the liquid foods. In this research, a dielectric barrier discharge non-thermal plasma pasteurization system will be developed. The system will consist of an NTP reactor with two electrodes covered by dielectric material, a gas injection device to induce gases in the form of bubbles into liquid, a high voltage power supply to drive reactor. Fine gas bubbles are created within the liquid samples to be treated within the reaction chamber.

In our study, water and liquid foods inoculated with *E. coli* and *Salmonellae* will serve as testing samples. The effect of working parameters such as discharge voltage, frequency, flow rate and treatment time on bacterial inactivation will be investigated.