Keynote Speaker

Design of a High Voltage Multiplier for a Non-Thermal Food Processing System Utilizing Underwater Shockwaves

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Abstract

In the aging society such as Japan, nutritious and fresh processed foods are required for elderly persons and small children. To provide nutritious and fresh processed foods at low cost, non-thermal food processing utilizing an underwater shockwave is one of the most promising methods. By utilizing the underwater shockwave, this method destroys the cell wall and organization of foods without heating. The non-thermal food processing system is mainly composed of a high voltage multiplier, a pressure vessel, a high voltage relay, and a big capacitor. Therefore, a high voltage multiplier is the vital component to realize an efficient non-thermal food processing system. In this talk, a design of high voltage multipliers is introduced for the non-thermal food processing utilizing underwater shockwaves. First, the problem definition of existing voltage multipliers is described. Next, the circuit configuration and operation principle of the proposed voltage multiplier are explained. Then, experimental results are shown to confirm the validity of the non-thermal food processing system using the proposed voltage multiplier. Finally, conclusion and future work are described.