

High intensity pulsed light (HIPL) and blue light (BL)

Principles

Pulsed light (PL) refers to short and intense pulses of broad spectrum radiation (200–1100 nm) ranging from UV to near infrared. It is generated by accumulating the electrical energy in a capacitor and releasing it over an inert gas (such as xenon) in the lamp within a short time, which greatly magnifies the power. PL is also known as pulsed UV-light, because approximately 50% of energy is in the UV-C range (200–280 nm).

Benefits



Not leaving undesirable residues and packaging decontamination



Short duration of treatment



Microbial inactivation



Improved foaming properties of solutions with high protein content such as whey.



Challenges

- PL is a non-thermal technology only under short durations or low fluence, whereas prolonging exposure time would significantly increase the sample temperature.
- The product quality depends on the application of PL at proper fluences. Though the high PL fluence allows greater microbial reductions, it promotes temperature increase and product quality deterioration.
- To achieve industrial scale use of PL technology for food disinfection, more efforts are required to optimize the operating conditions, develop novel equipment to minimize shadow effect, and use cooling systems to reduce rising temperatures.