

## 纳米二氧化钛闪照强光光催化杀菌与保鲜技术初探

### Preliminary study on technology of disinfection and preservation by photocatalysis using nanometer $TiO_2$ and flashlight

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中文摘要:

利用纳米二氧化钛光催化活性高的特性,对纳米二氧化钛闪照强光光催化杀菌与保鲜技术进行了初步研究;采用 $L_{16}(4^5)$ 正交试验探讨了纳米二氧化钛浓度、强光的闪照次数、闪照距离和菌液浓度等因素对枯草芽孢杆菌、大肠杆菌杀灭效果的影响;并对龙眼进行保鲜试验。结果表明,纳米二氧化钛在闪照强光作用下对枯草芽孢杆菌、大肠杆菌具有杀灭作用,也能延长龙眼保质期。当 $TiO_2$ 浓度为 $4.0 \times 10^{-4}$  g/mL,闪照次数30次时,杀菌效果最好;当保鲜薄膜含纳米二氧化钛 $1.3 \times 10^{-4} \sim 1.5 \times 10^{-4}$  g/cm<sup>2</sup>,闪照距离为8 cm,闪照次数为10次,龙眼保鲜效果最好。

英文摘要:

On the basis of the higher photocatalysis characteristics of nanometer  $TiO_2$ , the technology of disinfecting and keeping fruit fresh by photocatalysis using nanometer  $TiO_2$  and flashlight was probed. The effect of the dosage of nanometer  $TiO_2$ , the times of flashlight, the distance between flashlight source and the target object and the original concentration of bacteria on disinfecting the bacteria (*Bacillus Subtilis*, *Escherichiacoli*) was studied by means of  $L_{16}(4^5)$  orthogonal experiments. The experiment of keeping longan fresh by the photocatalysis was also done. The results show that the photocatalysis using nanometer  $TiO_2$  and flashlight is effective for disinfecting the bacteria and extending longan shelf life. The optimal result was obtained: a)for disinfecting the bacteria, the dosage of  $TiO_2$  is  $4.0 \times 10^{-4}$  g/mL and the flashlight times is 30; b)for extending longan shelf life, the times of flashlight is 10, the distance between flashlight and the target object is 8 cm, the added amount of  $TiO_2$  to plastic film is  $1.3 \times 10^{-4} \sim 1.5 \times 10^{-4}$  g/cm<sup>2</sup>.

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