

## CHAPTER 6

### Overall Conclusions

This research stated a comprehensive investigation of ethion degradation in tangerine fruits by titanium dioxide photocatalysis divided into three parts; (i) the optimum conditions and oxidative degradation of treated standard ethion solution, (ii) the reduction of ethion residue in tangerine fruits and postharvest quality of tangerine fruits during storage after TiO<sub>2</sub> photocatalysis, and (iii) the toxicity of degraded ethion solution and wastewater after washed tangerine fruits. The results from the overall chapter could be concluded as follows;

1. The standard ethion degradation after TiO<sub>2</sub> photocatalysis treatment increased with increasing contact time and amount of TiO<sub>2</sub> powder. TiO<sub>2</sub> powder had the effect in reducing ethion concentration with the highest rate change of 76.8%, compared to the untreated treatment. The concentration of phosphate and sulphate groups from the ethion solution increased in relation to the increasing ethion degradation. However, the ethion solution has not a toxic product during the TiO<sub>2</sub> photocatalysis process.

2. The titanium dioxide photocatalysis had the highest efficiency to reduce ethion residue in tangerine by 77.2%, with decreasing of microorganisms contaminations and no impact on quality assessment of tangerines after storage at 5 °C for 45 days.

3. TiO<sub>2</sub> photocatalysis reduced toxicity of ethion by brine shrimp lethality test (BST) with the LC<sub>50</sub> value of 765.8 mg mL<sup>-1</sup>. Toxicity evaluation in washing water of tangerine fruits indicated that ethion toxicity decreased by TiO<sub>2</sub> photocatalysis.