

CHAPTER V

CONCLUSIONS AND FUTURE WORK

5.1 Conclusions

The electrooxidation of oxytetracycline, tetracycline, chlortetracycline and doxycycline was investigated at the Au electrode and anodized BDD electrode using cyclic voltammetry. It was found that tetracyclines provided well-defined cyclic voltammograms at both electrodes.

The PAD waveform parameters including E_{det} , t_{del} , t_{int} , E_{oxd} , t_{oxd} , E_{red} and t_{red} were optimized at both Au and anodized BDD electrode by HPLC system. The HPLC conditions were carried out using the mobile phase of phosphate buffer (0.01M, pH 2.5)-acetonitrile (80:20; v/v) on a C₁₈ column at a flow rate of 1.0 mL/min at room temperature. To obtain better detection limit and sensitivity, two kinds of electrodes, the Au and the anodized BDD electrodes were examined. It was found that the anodized BDD electrode provided lower detection limit, wider linear range and higher sensitivity than the Au electrode.

HPLC-PAD at the anodized BDD electrode has been successfully applied to determine TCs in shrimps. For the validation of this method, the linear concentration range of TCs was 0.1 to 100 mg/kg, with correlation coefficient $R^2 > 0.99$. The LOD of this method was in the range of 0.01-0.05 mg/kg and the LOQ was in the range of 0.1-100 mg/kg. The recovery of TCs at the spiking level of 0.5 mg/kg, 1.0 mg/kg, 5.0 mg/kg and 10 mg/kg were studied. The recovery was in the range of 75.8-98.4% with $RSD < 10\%$. These results indicated that HPLC-PAD at the anodized BDD provided high accuracy and precision, respectively.

The HPLC-PAD method and the AOAC official method were compared for the quantitative analysis of TCs in shrimp. The values of recovery of HPLC-PAD were higher than these of the AOAC official method. The quantitative analysis of TCs

in shrimp samples was investigated by Laboratory Center for Food and Agricultural Products Company Limited (LCFA). Two kinds of shrimp samples; farming shrimp sample and sea shrimp sample, were used to detect TCs by the developed method, the AOAC Official method. Moreover, the determination of TCs in these samples was also detected by Laboratory Center for Food and Agricultural Products Company Limited (LCFA). The results are shown in Table 4.14 and 4.15. The results showed that OTC, TC and DC were not found in both samples, except CTC was found to be 0.07 mg/kg in sea shrimp by LCFA. TCs in both samples were not found when using HPLC-PAD and AOAC Official method.

5.2 Future Work

The HPLC-PAD with the anodized BDD electrode can be used for analysis of TCs in the other complex samples, such as milk, fish, meat, etc. Moreover, HPLC-PAD can be developed for determination of other antibiotic groups, such as sulfonamides, chloramphenicol, aminoglycosides, etc.

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