

CHAPTER V

CONCLUSIONS AND SUGGESTION FOR FURTHER WORK

5.1 Conclusions

Ni-implanted boron-doped diamond electrode (Ni-DIA) was used in view of their application for tetracyclines. This electrode produced well-defined cyclic voltammograms with significantly higher S/B ratios than those obtained from the boron-doped diamond and glassy carbon electrode. These results indicate a promising use of Ni-DIA for the detection of tetracyclines. The advantages of this Ni-DIA electrode includes:

1. Low background current and noise signals
2. Good electrochemical activity without the need for pretreatment
3. Chemically inert surface that is resistant to fouling and results in a drastic increase in the catalytic activity and sensitivity of the electrode
4. Wide linear range over 1-3 order of magnitude

Flow injection analysis with amperometric detection using the Ni-DIA electrode for the determination of tetracycline hydrochloride also enhanced the sensitivity and improved the detection limit (as low as 10 nM) with decent reproducibility. The method was very precise with good recovery results. Interference was also studied for the tetracycline capsule. No interference was observed from the commonly present inactive ingredient in pharmaceutical formulation. Application of the proposed method for determination of tetracycline in commercially available tablet forms shows that this method is precise, accurate and very sensitive.

Reversed-phase HPLC with electrochemical detection was chosen for the analysis of tetracycline, oxytetracycline, chlortetracycline and doxycycline in shrimp sample. A good separation of 4 compounds was achieved by using HPLC conditions as mentioned in the previous chapters (Table 3.3).

The methods were validated over the concentration range 0.05-100 ppm with overall average recoveries from 83.3 to 102.5% and RSD of less than 10%. These techniques remarkably improved the analysis method of tetracycline in shrimp sample because they can be performed quickly and the use of complex buffer and extraction procedures can be avoided. All tetracyclines residues in fortified shrimp samples were in good agreement with those performed by an AOAC official method 995.09 (Chlortetracycline, Oxytetracycline and Tetracycline in edible animal tissues) and the result obtained from the Laboratory Center for Food and Agricultural Products Co.,Ltd (LCFA).

5.2 Suggestion for further work

In this study, the real samples studied were only the drug formulations and shrimp samples. Other samples such as milk and animal feed should be of particular interest for this study as well. Also the ion implantation technique has proven to possess a great potential. Thus, further attempts to apply the ion implantation method for preparing stable composite material will open up many possibilities in the development of new superior functional materials.

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