

CHAPTER V

CONCLUSION

5.1 Conclusion

A novel electrospun fibrous polymer membrane as SPE adsorbent was used for extraction of aldehydes in water samples. Analysis of aldehydes in water samples was carried out using the method based on DNPH derivatives. DNPH-coated electrospun fibrous polymer membrane as SPE sorbent was used for the derivatization, preconcentration and extraction of aldehydes in one step. The optimized coating and extraction conditions were efficient for identification and quantification of aldehydes in water samples. The preparation of DNPH-coated electrospun polymer fibers and the extraction of aldehydes by this sorbent can be summarized in Figure 5.1 and Figure 5.2. The optimum conditions for coating of membrane were using DNPH in acidic HCl-water-acetonitrile with the concentration of 300 mg/L. 3 mL of DNPH solution was coated at the flow rate of 100 μ L/min. For desorption of DNPH-aldehydes derivatives, acetonitrile was the best desorption solvent due to its high polarity with the elution volume of 100 μ L. The optimum extracting flow rate of aldehydes sample was 1.00 mL/min. Moreover, the electrospun fibrous nylon6 membrane offered better extraction in terms of recovery compared to electrospun fibrous PS and PAN membrane due to nylon6 had smaller fibers size and strong interaction between the fiber sorbent and DNPH-aldehydes derivatives. The high surface to volume ratio and low-pressure drop of electrospun fibrous nylon6 membrane is suitable to deal with large volume samples. After that, the method was applied to the analysis of drinking water samples. The percentage recoveries of aldehydes at 10 μ g/L spiked in drinking water ranged from 42.3-83.8%.



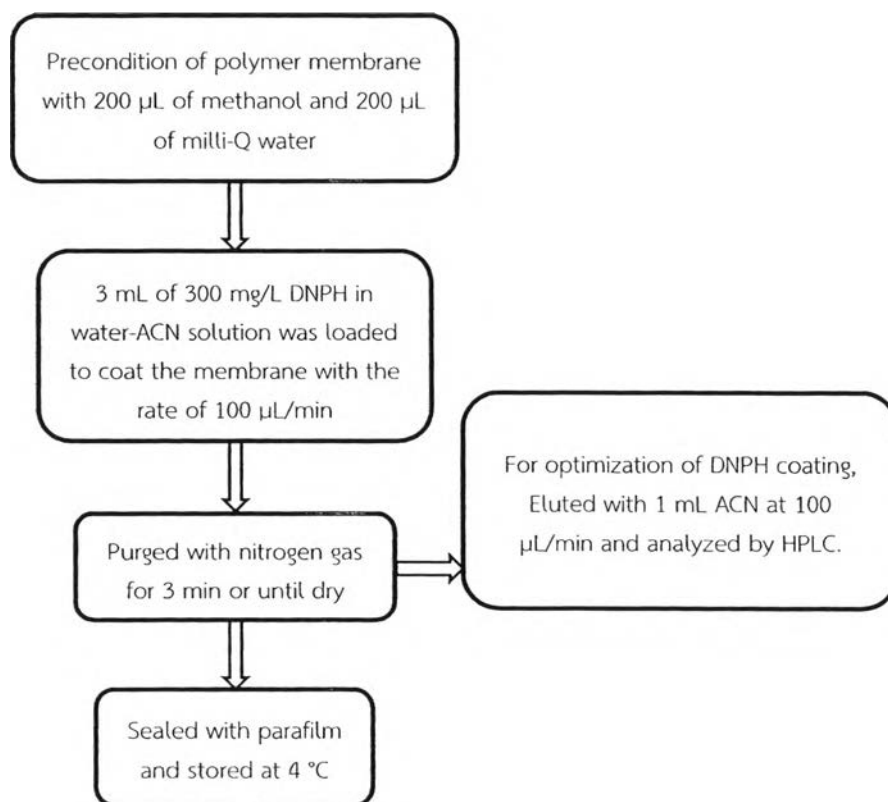


Figure 5.1 Flow chart of preparation of DNPH-coated polymer membrane.

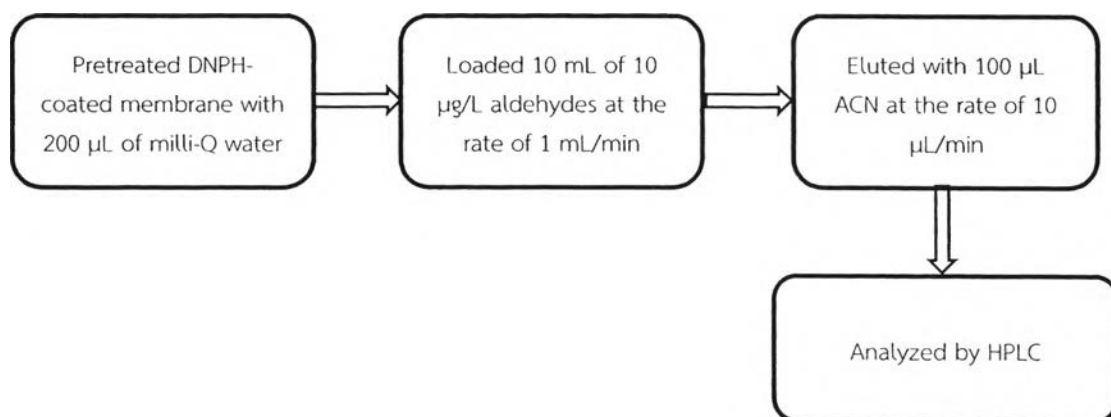


Figure 5.2 Flow chart of derivatization and extraction aldehydes in water.

5.2 Suggestion of future work

The novel adsorbent with good efficient adsorption was obtained. Electrospun fibrous polymer membrane could be development by further modifying morphous, structure and functionalization for higher extraction efficiency. Moreover, sorbent could be improved for better selectivity for various interested compounds and a larger sample loading volume. Moreover, other conditions that may be affect the extraction process should be further study for example, volume of aldehydes used during extraction and time during elution of aldehydes-DNPH derivative. As well as, limits of detection (LODs) and limits of quantification (LOQs) should be study to confirm the accuracy of the method.

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