EVALUATION OF COMMERCIAL DRINKING WATER FILTERS FOR REMOVAL OF ANIONS AND CATIONS USING ION CHROMATOGRAPHY

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FACULTY OF SCIENCE AND TECHNOLOGY
UNIVERSITY COLLEGE OF SCIENCE AND TECHNOLOGY MALAYSIA

2004/2005

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By

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Research Report submitted in partial fulfillment of
the requirement for the degree of
Bachelor of Science (Analytical and Environmental Chemistry)

Department of Chemistry Science
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2004 / 2005

ACKNOWLEDGEMENTS

First of all, I deeply grateful to my supervisor, Dr. Ismat Ali Takruni, for his professional guidance, valuable advices, encouragements and supervisions in helping me to complete the work successfully. It is proud and honor to work with him.

Meanwhile, I am also grateful to co-supervisor, Prof. Dr. Norhayati Mohd. Tahir, for her guidance and suggestions during the lecture study.

To technical staffs of Chemistry Department, very grateful for their work hard, tolerant and kind so that easy and comfortable for me to finish the lab work.

I am grateful to my beloved parents and family for their faithful supports, encouragements and sharing problem from the beginning to the end.

Finally, I am grateful to the Faculty of Science and Technology of KUSTEM for their generous financial support for this work.

ABSTRACT

Seven inorganic anions (F^-, Cl^-, NO_2^-, NO_3^-, PO_4^{3-}, SO_4^{2-}) and six cations (Li^+, Na^+, NH_4^+, K^+, Ca^{2+}, Mg^{2+}) in the filtered water samples were analyzed by means of the suppressed column ion chromatography. Eluent concentration, pH of eluent, eluent flow rate and injection volume were optimized to enhance the sensitivity. Detection limit and quantification limits were estimated in range of 0.002 to 0.746 mg/l. Samples analysis were performed with good estimated reproducibility with relative standard deviation (RSD) within 5.00% except the one sample. All filter devices from RM40.00 to RM120.00 are not significantly remove the anions and cations but removed 33.00% of fluoride from tap water. None to the samples concentration are excess the WHO guideline value.

ABSTRAK

Tujuh inorganik anion dan enam kation terkandung dalam sampel penapis air telah dikaji menggunakan kromatografi yang dilengkapkan dengan turus pecahan. Kepekatan eluen, pH eluen, kadar aliran eluen dan isipadu suntikan telah dioptimumkan untuk meningkatkan kepekatan alat kromatografi ion. Had pengesanan dan had kuantifikasi menghitung adalah dalam lingkungan 0.002 hingga 0.746 mg/l. kebolehulangan sampel analysis adalah baik dengan nilai sisihan piawai relatif yang dibawah 5.00%. Semua penapis air berharga RM40.00 hingga RM120.00 tidak berfungsi nyata untuk mengurangkan anion dan kation tetapi mengurangkan 33.00% fluoride dari air paip. Tiada kepekatan sampel melebihi nilai garis panduan Pertubuhan Kesihatan Sedunia (WHO).