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JINTANA VARARUSSAMI: A MODIFIED METHOD FOR DETERMINATION OF HIPPURIC ACID AND METHYLHIPPURIC ACID IN URINE BY GAS CHROMATOGRAPHY. THESIS ADVISORS: PORNPIMOL KONGTIP, Ph.D., VICHAI PRUKTHARATHIKUL, M.Sc.,VAJIRA SINGHAKAJEN, M.A. 132 p. ISBN 974-662-949-2

The study was undertaken to develop a method to modify a gas - liquid chromatographic method (GLC method) for simultaneous determination of hippuric acid (HA) and methylhippuric acid (o-, m- and p-MHA) (metabolites of toluene and xylene) in urine. A known concentration of heptadecanoic acid (internal standard) was added into urine. The mixture was extracted with ethyl acetate after acidification, and methanol in acid medium (HCl) was added to the dried extracts for derivatization. The methyl esters of HA, o-, m-, p-MHA and internal standard were re-extracted with chloroform and analyzed by GC with a DB™ - 1 capillary column.

This study was undertaken to investigate the appropriate time for derivatization and the reliability of the method in respect to detection limit, accuracy and precision. Results were compared with those from high performance liquid chromatographic method (HPLC method)(NIOSH 8301).

The results revealed that the appropriate derivatization time was 45 min. The minimum detectable limit was 0.05 mg/ml for urinary HA, and 0.015 mg/ml for urinary o-, m- and p- MHA. The percent recoveries of all acids were more than 97.50% and the percent coefficient of variations were less than 5.50%. The results were not significantly different from the HPLC method at a confidence limit of 95% over the concentration ranging from 0.05 to 1.00 mg/ml for HA and 0.025 to 0.50 mg/ml for o-, m- and p- MHA. The correlation coefficients of HA, o-, m- and/or p-MHA obtained by the two methods were 0.997, 0.993 and 0.998, respectively. This study was applied to analyze urine samples from paint industrial workers. The analytical results by the GLC method highly correlated with those by the HPLC method. The correlation coefficients and regression equations of HA, o-, m- and p-MHA between the two methods were 0.992, $Y = 1.041X+0.006$; 0.975, $Y=0.938X+0.002$ and 0.992, $Y=0.928X - 0.006$, respectively.