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GAS CHROMATOGRAPHIC-MASS SPECTROMETRIC DETERMINATION OF O-PHTHALIC ACID ESTERS IN LOW ALCOHOL WINES COUPLED WITH MICROEXTRACTION PRECONCENTRATION

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Esters of phthalic acid are very dangerous for human health. In this study, the high sensitive gas chromatographic-mass spectrometric determination of phthalates in low alcoholic beverages (champagne, red and white wine), coupled ultrasound-assisted emulsification-microextraction was developed. The sources of possible systematic errors were investigated and those include: leaking of o-phthalates from chromatographic septum; contamination of phthalate in solvents; influence of macro components of wines (sugar, alcohol, anthocyanins); the hydrolysis of o-phthalates and others. For the first time, it was shown that the impact of these factors can lead to an overestimation or underestimation of the actual concentration of impurities by 1–2 orders of magnitude. The methods of accounting or elimination of systematic errors were proposed. Purification of solvents by Rayleigh distillation method allows obtaining samples with impurity content lower than (1-4) × 10^{-3} mgL^{-1}. Containers for sampling and storage of samples to be analyzed should be made of borosilicate glass or quartz. The content of phthalates in wines was 0.03–1 mgL^{-1}. The limits of detection of esters of o-phthalic acid were at the level of 10^{-6} – 10^{-5} mgL^{-1} and were highly competitive with the best world results. The relative expanded uncertainty of the determination of toxicants was at the level of 13–30%.

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