

ANALYSIS OF PHENOL IN PLASTIC PRODUCTS BY HPLC

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ABSTRACT

Phenol is used in the production of plastics and dyes. The substance may be contained in packaging material for food and in toys. Phenol can enter the body when people drink contaminated water, eat contaminated food, or contact products containing phenol. This can result in human health problems. Quantitative analysis of phenol in plastic products is performed by the modified European Standard EN 71:2005 Safety of toys method. The analytical method consists of extraction of phenol in plastic samples with deionized water, filtration and then analysis by high-performance liquid chromatography with diode-array detection. The phenol concentration (mg/L) in the aqueous sample could be determined directly from a calibration graph. The calibration graph showed a good linear range from 0.2 mg/l to 10 mg/L. The limit of detection and limit of quantitation were 0.03 mg/L and 0.2 mg/L, respectively. The recoveries of phenol in plastics were between 80% and 120% close to the quantitative recovery for the method used. Intermediate precisions were 0.01-0.04%. This method provides good repeatability, high sensitivity and simple approach to analyze the phenol in plastic products. In addition, the percentage measurement uncertainty at 95% confidence level of phenol was less than 20% throughout concentrations of working range that subjected to target uncertainty. Therefore, this method was fit for the intended use.

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