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**The Thesis Submitted for the Degree of M. Sc  
In the field of Analytical Chemistry**

**Development of a new pH-assisted liquid phase microextraction using a switchable solvent for the determination of polychlorinated biphenyls (PCBs)**

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## **Abstract**

Polychlorinated biphenyls (PCBs) are a class of synthetic organic compounds that are hazardous due to their chemical and thermal stability, hydrophobicity and toxic properties [1-2]. Because of their chemical and thermal stability, PCBs has an application in wide range of industries and may enter the environment. PCBs are on the list of priority pollutants of Environmental Protection Agency which are required to be analyzed with adequate methods. But, PCBs often exist at trace levels of concentration in the environment, so an effective pretreatment step is necessary for their pre-concentration before quantification. In this study, a new method was successfully developed for the simultaneous determination of seven polychlorinated biphenyls in aqueous samples with switchable hydrophilicity solvent based liquid phase microextraction coupled to GC-MS detection. The factors influencing the extraction efficiency, including type and volume of extraction solvent, pH and volume of aqueous sample, extraction time, and salt addition were investigated and optimized. Under the optimized conditions, good linearity (0.5-150  $\mu\text{g/L}$ ) and limits of detection (0.15  $\mu\text{g/L}$ ) were obtained for the PCBs by the proposed method. Also, the relative standard deviation was calculated between 5.2 and 6.4 %. Finally, the proposed method was successfully applied for the analysis of PCBs in various real samples

**Keywords:** Polychlorinated biphenyls, Triethylamine, Switchable solvent, Homogeneous liquid phase microextraction