CHAPTER 5

CONCLUSION

According to the results show in Table 4.1-4.15, the shaking times used for microextraction of PAHs, e.g., fluorene, acenaphthene, phenanthrene, fluoranthene and pyrene are 20 min, 10 min and 4 min for the sample to solvent ratios of 9:1, 5:5 and 2:8, respectively for all of the solvents, i.e., carbon disulfide, cyclohexane and methylene chloride. The optimum amount of sodium chloride used for microextraction of PAHs are 2.0 g for the ratio of 9:1, 1.0 g for the ratio of 5:5 and 0.5 g for the ratio of 2:8 and the optimum amount of sodium sulfate used in the extraction of PAHs are 2.0 g, 1.0 g and 0.5 g for the ratios of 9:1, 5:5 and 2:8, respectively.

Since various parameters effect on % recoveries of PAHs, i.e., extracting solvents, sample to solvent ratios and salting out effect are studied and the results of % recoveries are in the ranges of 27.79-105.70 % with % RSD 0.00-9.80 % as shown in Table 4.16-4.25. The sample to solvent ratio of 9:1 seems to be the suitable ratio used for the microextraction of PAHs. The carbon disulfide is considered as a suitable solvent and sodium sulfate is selected as the salt used to improve the % recoveries. Therefore the 9:1 ratio, carbon disulfide and sodium sulfate is considered as the best combination for microextraction of PAHs.

The results of the % recoveries of PAHs obtained from using this combination are in the range of 96.62 % to 104.88 % with % RSD 0.17-0.85 %. The accuracy of microextraction technique is carried out by using this microextraction technique and the results from the analysis of the synthetic unknown mixture solutions show that the % errors of PAHs range from 0.22-1.72 % as can be seen from Table 4.28. The results of the minimum detectable level studied show that less than 20 ppb (µg/L) of these PAHs in a 9 mL aqueous solution are easily detected. Moreover, three water samples collected from various sites are analyzed by using this combination and the results show that one of them contains 65 ppb of phenanthrene.

For the futher work, the determination of PAHs levels in various environmental samples by using microextraction technique should be interested. The capillary column should be used to improve the separation of PAHs and their analysis time. Since the bleeding from the capillary column is less than the packed column used in programmed temperature gas chromatography, thus the baseline drift can be eliminated by using the capillary column. In addition, the high efficiency of the capillary column over the packed column yields the sharppest peak than the packed column does. Therefore, the minimum detectable level of PAHs can be lowered by using capillary column.