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Liquid Chromatographic and validation study in separation and determination of benzidines and phenols in the main discharge point of wastewater

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Abstract : Benzidines and phenols are the most priority pollutants. Separation and quantitative estimation of priority pollutant benzidines composed of various benzidines BZ, including substituted 3, 3'-dichlorobenzidine DCB and 3, 3'-dimethylbenzidine DMB, and priority pollutant phenols (9 compounds, i.e., phenol, 2- and 4-nitrophenol, 2,4-dimethylphenol, 2-, 2,4-di-, 2,4,6-tri-, Penta- chlorophenol, and 4-chloro-3-methylphenol)was performed using high performance liquid chromatography-ultra violet techniques. Both groups were separated using a C_{-18} column with a UV detector at a wavelength of 280 nm, and the flow of the mobile phase was isocratic. The mobile phase consisted of 75:25 methanol: water. The column temperature was 50°C, and the flow rate was 1.8 ml/min for the Benzedine's separation. The mobile phase consisted of a 50:50 acetonitrile: phosphate buffer. The optimum pH was 7.1, the flow rate was 0.7 ml/min and the optimum column temperature was 45°C for the phenols separation. The separation parameters were calculated, including the chromatographic parameters such as the capacity factor (k), the number of theoretical plates (N) , the selectivity factor (α), and the resolution factors (Rs).This method was applied to real samples. The water samples that were analyzed were obtained from a petroleum refinery wastewater treatment unit. The results ranged between undetectable levels and 246.9µg/L of the selected benzidines.The results were ranged between undetectable levels and 1865.61 µg/L of the selected phenols.

Keywords : *Chromatographic study, Petroleum refinery wastewater, Benzidines, Priority pollutant Phenols, HPLC.*

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