Abstract :

The use of chemometric methods such as response surface methodology (RSM) based on statistical design of experiments (DOEs) is becoming increasingly widespread in several sciences such as analytical chemistry, engineering and environmental chemistry. The optimization of the hydrolysis degradation of the neurotoxic organophosphor us pesticide methyl parathion (MP) was carried in presence of aqueous solution decontaminant containing Monoethanolamine (MEA).For the optimization,an experimental design was used based on the surface response methodology; it was applied to assess the individual and interaction effects of several operating parameters (Temperature, pH and ratio R [MEA]/[MP]) on the yield of hydrolysis degradation of methyl parathion. A composite face centered (CCF) experimental design was employed.Based on the experimental design data, a semi empirical expression was obtained, allowing to predict and to optimize the yield of hydrolysis degradation of methyl parathion. This model was very consistent with experimental results (correlation factor: 99.70%). Optimal experimental conditions found for hydrolysis of methyl parathion (30 $mg.l^{-1}$) were temperature (≈95°C), pH (9.20) and ratio R([MEA]/[MP]:5.4/1). Graphical response surface and contour plots were used to locate the optimum poin (30 $mg.l^{-1}$)