

Abstract

This Bachelor's thesis focuses on the separation of chlorophenoxypropionic acids and their derivatives by a high-performance liquid chromatography. The separations were performed in a reversed phase mode. These compounds are employed as herbicides, i.e. chemical substances to control unwanted plants, to kill weeds. The herbicides studied for the purposes of this thesis were 2-(4-chloro-2-methylphenoxy)propionic acid, 2-(2,4-dichlorophenoxy)propionic acid, 2-(2-chlorophenoxy)propionic acid, 2-(3-chlorophenoxy)propionic acid and 2-(4-chlorophenoxy)propionic acid. The study aimed at finding and optimizing chromatographic conditions for simultaneous separation of all five herbicides mentioned above.

The analysis employed two types of columns, that is ZORBAX SB-C8 column and ZORBAX Eclipse XDB-C18 column whose level of polarity differ. As mobile phases, there were used acetonitrile/water, acetonitrile/formic acid, pH 2.1 and methanol/formic acid, pH 2.1 in various volume ratios.

ZORBAX SB-C8 column, mobile phase methanol/formic acid (concentration of 0.365 mol/l, pH 2.1) 40/60 (v/v), temperature of 25°C, and flow rate of 1 ml/min delivered the most convenient separation conditions. Given these isocratic conditions, all the herbicides were baseline separated within 80 minutes.

Keywords:

HPLC, separation, herbicides. derivatives of chlorophenoxypropionic acid