

Comparison of Gas Chromatography and High Performance Liquid Chromatography for the Analysis of Trace Explosives

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The detection of several kinds of trace explosives has become enormously important in order to protect people, infrastructures, and properties. Consequently, this project compares two analysis techniques—HPLC and GC—to determine which is faster, more selective, more sensitive, gives higher resolution and is more accurate, even with the smallest quantities, without requiring difficult sample preparation, for detecting trace explosives. Six representative explosive compounds (2-NP, 3-NP, 4-NP, 2,4 DNT, 2,6 DNT and 1,3 DNT) on three different surfaces (glass, plastic, and wood) were analysed with both HPLC-DAD and GC-MS. Several dilutions, ranging from 1.0 mg mL⁻¹ to 1.0 ng mL⁻¹, and two different calibration curves were made for each compound based on the results for each instrument. The results indicated that the 2, 3 and 4 nitrophenols seem to have better stability and recovery than other compounds, particularly when using GC-MS. A better recovery was obtained when using a glass surface, which was followed by plastic and then wood surfaces, with wood having the poorest recovery. For example, the 4-NP has been recovered with a measurement of 324.25 ng mL⁻¹, 164.45 ng mL⁻¹ and 23.5 ng mL⁻¹ for glass, plastic and wood respectively. Sometimes the trace explosive could only be detected when using GC-MS, as it is more sensitive than HPLC-DAD.

Biography

Suliman Khan has expertise in about biotechnology and food technologies. He works on fraud food and food spoilage determination, controlling, by different fast nondestructive technologies. He has MPhil or Master biotechnology and PhD scholar school of food and biological engineering Jiangsu university Jiangsu china. He teaching as lecturer in college national and international level.

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