Ion mobility spectrometry (IMS) is a technique that involves the characterization of molecular ions on the basis of electrical mobility differences. The ion mobility spectrometer consists of three core components: the ionization region, the drift tube, and the detection region (Figure 1).

Developed by Cohen and coworkers in the 1970s, IMS has recently evolved into an effective analytical tool that has contributed to the analysis of samples in almost every area, ranging from toxic chemical detection to food processing. Particularly, IMS has recently been applied to environmental analysis due to its low cost, low maintenance, portability and low...
detection limits. Despite the capabilities of IMS as a powerful analytical tool for environmental analysis, the complexity of real environmental samples in addition to competitive ionization reactions between target analytes and interfering substances can lead to complex product ions and complicated IMS signals (4-6). In order to combat these drawbacks, several sample pre-treatment methods have been employed that synergistically function with the IMS device to improve selectivity, such as solid phase microextraction (7-12) and gas chromatography (13-16). Furthermore, the addition of alternate reagent gases, or dopants, to the IMS can alter ionization processes so that competitive ionization between the target analytes and interfering substances will be suppressed (17-19). By utilizing these approaches, problems pertaining to IMS selectivity related to the nature of environmental samples can be alleviated.

References:

2) G. A. Eiceman, Ion Mobility Spectrometry. 2nd Ed. (2005)
11) Ormsby. JAIC 2005, 44, (1) 13-26