FUNDAMENTALS OF TRAVELLING WAVE ION MOBILITY REVISITED: TOWARDS UNIVERSAL CALIBRATION

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OVERVIEW

METHODS

Basic TWIM Theory


ION MOBILITY SYSTEMS

FLAME MOBILITY, VON ION SYSTEMS

Flame mobilities of unsaturated hydrocarbons were determined using a conventional flame ionization detector.

The main characteristic ofTWIM is that ions move in a rotating electric field, which induces a velocity change for ions with different mobilities. In TWIM, this is achieved by applying a rotating electric field, which is typically a traveling wave. The velocity of ions in TWIM is determined by the phase of the traveling wave at which the ion enters the device. A higher phase will result in a lower velocity and vice versa. TWIM is particularly useful for the analysis of small molecules, such as peptides and proteins, due to its ability to separate ions based on their mobility.

CONCLUSION

The improved understanding of behavior of ions in TWIM devices and optimization of experimental conditions for calibration and quantitative analysis are essential for the development of TWIM as a powerful tool for the analysis of complex mixtures. The results presented in this study demonstrate the potential of TWIM for the accurate measurement of ion mobilities and mass-to-charge ratios, and highlight the importance of optimizing experimental conditions for improved performance. Further research is needed to investigate the mechanism of ion mobility measurements in TWIM and to develop new strategies for the optimization of TWIM experiments.