Investigating Gas Composition on Transport and Desolvation of High m/z Species in the First Vacuum Stages of a Mass Spectrometer

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RESULTS

In all previous published experiments on enhancing high mass m/z ion transmission via an orthogonal time-of-flight mass spectrometer, additional gas has been introduced into the initial ion source of the instrument, the efficiency of the pumping in the source region has been reduced, or replacing argon in the calibration cell with a linear (1, 2, 3, 4). Here we demonstrate that by introducing a polyatomic gas, such as SF6, as a sweep gas, in addition to the source modifications, detection of high m/z ions, such as GroEL, can be enhanced (Figure 2).

Methods

Sample and Gas Systems

Samples and gas systems were used at a pressure of 100 L/hour to 700 L/hour to investigate optimal conditions for ion transmission and transmission over that obtained with octafluoropropane. The multiply charged GroEL ions were not even detectable when nitrogen, argon or xenon were used as a cone gas. For example, SF6 (in argon) and octafluoropropane used in the trapping and transfer region of the Synapt, ions of high m/z are not detectable in SF6 and octafluoropropane (Mr 188) possessing 21 and 33 degrees of freedom respectively, as opposed to the 3 degrees of freedom (99) of nitrogen (95).

CONCLUSION

SF6 can also be used as an IMS gas, providing very well resolved spectra with narrow m/z spreads within the mass spectrometer. The kinetic energy of stripped oligomeric species and modelling unfolding intermediates.

REFERENCES

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