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(54) **DYNAMIC MULTIPLEXED ANALYSIS METHOD USING ION MOBILITY SPECTROMETER**

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(57) **ABSTRACT**

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A method for multiplexed analysis using ion mobility spectrometer in which the effectiveness and efficiency of the multiplexed method is optimized by automatically adjusting rates of passage of analyte materials through an IMS drift tube during operation of the system. This automatic adjustment is performed by the IMS instrument itself after determining the appropriate levels of adjustment according to the method of the present invention. In one example, the adjustment of the rates of passage for these materials is determined by quantifying the total number of analyte molecules delivered to the ion trap in a preselected period of time, comparing this number to the charge capacity of the ion trap, selecting a gate opening sequence; and implementing the selected gate opening sequence to obtain a preselected rate of analytes within said IMS drift tube.

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