Design and construction of an electrostatic ion reflector for a matrix-assisted laser desorption/ionization time-of-flight (MALDI-TOF) mass spectrometer

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A new linear mode matrix-assisted laser desorption/ionization time-of-flight (MALDI-TOF) mass spectrometer has been designed and constructed at the Department of Physics of the University of Colombo recently. Some developments have been made to increase its mass resolving power by designing and construction of a first order electrostatic ion reflector. The mechanical items and some electrical components that are necessary for the construction of the ion reflector were purchased from Sweden. The ion reflector was fully assembled and was incorporated to the existing MALDI mass spectrometer in Sri Lanka. The ion reflector was optimized in order to find the point of maximum initial velocity compensation. The comparison of the MH^+ peak in the MALDI mass spectra of Substance-P in the reflected mode showed a mass resolving power of 3,500 compared to 270 in the linear mode. It is expected that the MALDI-TOF mass spectrometer would be useful in the mass analysis of non-volatile low mass molecules such as natural products and high mass bio molecules such as proteins thus assisting natural product research and biological research in Sri Lanka.

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