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(54) Title: MASS SPECTROMETER

(57) **Abstract:** An improved FT-ICR Mass Spectrometer has an ion source (10) which generates ions that are transmitted through a series of multipoles (20) to an ion trap (30). Ions are ejected from the trap (30), through a series of lens and multipolar ion guide stages (40-90), and into a measurement cell (100) via an exit/gate lens (110). The measurement cell is mounted in a vacuum chamber (240) and this assembly is slideably moveable into a bore of a superconducting magnet (400) which provides the magnetic field to cause cyclotron motion of the generated ions in the cell (100). By minimising the distance between the source (10) and cell (100), and by careful alignment of the ion optics, the ions can travel at high energies right up to the front of the measurement cell (100). The cell (100) extends in the longitudinal direction of the magnet bore and is coaxial with that. The ratio of the sectional area of the magnet bore to the sectional area of the cell volume is small (less than 3). The magnet is asymmetric and is relatively short on the ion injection side. The cell (100) is supported from in front of the cell and electrical contact is from the rear thereof.



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