

Title (en)  
Mass spectrometer

Title (de)  
Massenspektrometer

Title (fr)  
Spectromètre de masse

Publication  
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Application  
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Abstract (en)  
A mass spectrometer 10 comprises an ion source 12 which generates nebulized ions which enter an ion cooler 20 via an ion source block 16. Ions within a window of m/z of interest are extracted via a quadrupole mass filter 24 and passed to a linear trap 30. Ions are trapped in a potential well in the linear trap 30 and are bunched at the bottom of the potential well adjacent an exit segment 50. Ions are gated out of the linear trap 30 into an electrostatic ion trap 130 and are detected by a secondary electron multiplier 10. By bunching the ions in the linear trap 30 prior to ejection, and by focussing the ions in time of flight (TOF) upon the entrance of the electrostatic trap 130, the ions arrive at the electrostatic trap 130 as a convolution of short, energetic packets of similar m/z. Such packets are particularly suited to an electrostatic trap because the FWHM of each packet's TOF distribution is less than the period of oscillation of those ions in the electrostatic trap.

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Citation (applicant)  
• US 5880466 A 19990309 - BENNER W HENRY [US]  
• US 5886346 A 19990323 - MAKAROV ALEXANDER ALEKSEEVICH [GB]  
• US 5572022 A 19961105 - SCHWARTZ JAE C [US], et al  
• US 5569917 A 19961029 - BUTTRILL JR SIDNEY E [US], et al  
• US 5179278 A 19930112 - DOUGLAS DONALD J [CA]  
• US 5420425 A 19950530 - BIER MARK E [US], et al  
• US 6011259 A 20000104 - WHITEHOUSE CRAIG M [US], et al  
• US 6020586 A 20000201 - DRESCH THOMAS [DE], et al  
• WO 9930350 A1 19990617 - UNIV BRITISH COLUMBIA [CA], et al  
• WO 9849710 A1 19981105 - MASSLAB LIMITED [GB], et al  
• EP 0113207 A2 19840711 - FINNIGAN CORP [US]  
• H. WOLLNIK, J. MASS SPECTROM. ION PROC., vol. 131, 1994, pages 387 - 407  
• C. PIADYASA ET AL., RAPID COMMUN. MASS SPECTROM., vol. 13, 1999, pages 620 - 624  
• S. MICHAEL ET AL., REV. SCI. INSTRUM., vol. 63, 1992, pages 4277 - 4284  
• M. SENKO ET AL., JASMS, vol. 8, 1997, pages 970 - 976  
• M. BELOV ET AL., ANALYTICAL CHEMISTRY, vol. 73, 2001, pages 253 - 261  
• M. MAY ET AL., ANALYTICAL CHEMISTRY, vol. 64, 1992, pages 1601 - 1605  
• M. KINTER, N.E. SHERMAN: "Protein Sequencing and Identification Using Tandem Mass Spectrometry", 2000, JOHN WILEY AND SONS  
• K. L. BUSCH, G. L. GLISH, S. A. MCLUCKEY: "Mass Spectrometry/Mass Spectrometry : Techniques and Applications of Tandem Mass Spectrometry", 1989, JOHN WILEY AND SONS  
• S. A. MILLER, H. LUO, S. J. PACHUTA, R. G. COOKS, SCIENCE, vol. 275, 1997, pages 1447 - 1450  
• MAKAROV, ANALYTICAL CHEMISTRY, vol. 72, no. 6, pages 1156 - 1162

Cited by  
US9035244B2; US8969794B2; US9472388B2

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