

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
16 December 2004 (16.12.2004)

PCT

(10) International Publication Number
WO 2004/109743 A3

(51) International Patent Classification⁷: **H01J 49/42**

(21) International Application Number:
PCT/GB2004/002337

(22) International Filing Date: 2 June 2004 (02.06.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0312940.0 5 June 2003 (05.06.2003) GB

(71) Applicant (for all designated States except US):
SHIMADZU RESEARCH LABORATORY (EUROPE)LTD [GB/GB]; Wharfside, Trafford Wharf Road, Manchester M17 1GP (GB).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **DING, Li** [GB/GB]; 1 Wenlock Road, Sale, Cheshire M33 3TR (GB). **BRANCIA, Francesco, Lorenzo** [IT/GB]; 27 Sibson Road, Chorlton-Cum-Hardy, Manchester M21 9RH (GB).

(74) Agent: **MATHISEN MACARA & CO.**; The Coach House, 6-8 Swakeleys Road, Ickenham, Uxbridge UB10 8BZ (GB).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

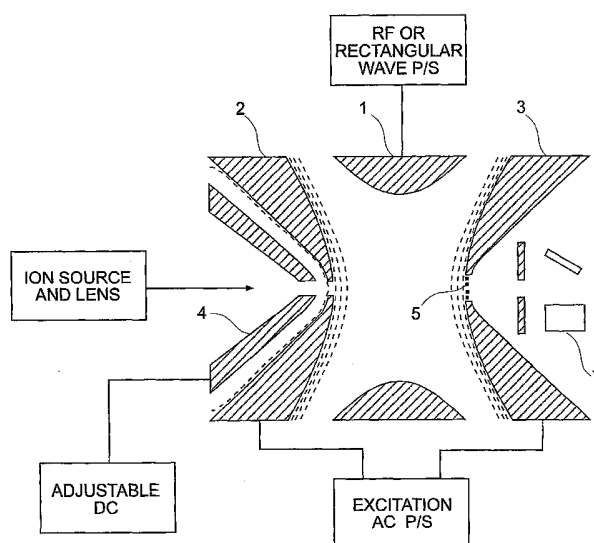
Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:
23 February 2006

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: A METHOD FOR OBTAINING HIGH ACCURACY MASS SPECTRA USING AN ION TRAP MASS ANALYSER AND A METHOD FOR DETERMINING AND/OR REDUCING CHEMICAL SHIFT IN MASS ANALYSIS USING AN ION TRAP MASS ANALYSER



(57) Abstract: A method for obtaining high accuracy mass spectra using an ion trap mass analyzer includes adjusting operating parameters of the analyser to enable a reverse mass scan in a mass selective resonance ejection mode and setting the trapping field to trap ions in a mass-to-charge ratio which has a lower limit close to the mass-to-charge ratio of an ion of interest. A method of determining chemical shift includes adjusting operating parameters of the analyzer to enable forward and reverse mass scans and calibrating the spectra obtained from the forward and reverse mass scans.

WO 2004/109743 A3

INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB2004/002337

A. CLASSIFICATION OF SUBJECT MATTER

H01J49/42

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
H01J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DING L ET AL: "A simulation study of the digital ion trap mass spectrometer" INTERNATIONAL JOURNAL OF MASS SPECTROMETRY, ELSEVIER SCIENCE PUBLISHERS, AMSTERDAM, NL, vol. 221, no. 2, 15 November 2002 (2002-11-15), pages 117-138, XP004390298 ISSN: 1387-3806 pages 128-130; figures 8-10 page 137, right-hand column	1-16
X	EP 0 579 935 B (VARIAN ASSOCIATES, INC) 28 July 1999 (1999-07-28) columns 5-6; figure 2	1
A	EP 0 701 471 B (VARIAN ASSOCIATES, INC) 7 April 1999 (1999-04-07) columns 9-12	1-16

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

1 December 2005

Date of mailing of the international search report

16/12/2005

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Loiseleur, P

INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB2004/002337

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0579935	B	28-07-1999	CA 2097210 A1	30-11-1993
			DE 69325752 D1	02-09-1999
			DE 69325752 T2	06-04-2000
			EP 0579935 A1	26-01-1994
			JP 3395983 B2	14-04-2003
			JP 6089696 A	29-03-1994
			US 5198665 A	30-03-1993
EP 0701471	B	07-04-1999	DE 69508866 D1	12-05-1999
			DE 69508866 T2	23-12-1999
			EP 0701471 A1	20-03-1996
			WO 9518670 A1	13-07-1995