

# Acronyms in Mass Spectrometry

*Spectroscopy* columnist Ken Busch once again brings readers his comprehensive list of common acronyms used in the field of mass spectrometry.

## Kenneth L. Busch

**A**cronyms used in mass spectrometry appear in printed publications of researchers working in established areas, and also are coined at and used in meetings, presentations, and proceedings. The latter especially reflect new applications, with new audiences, each of which generates a unique technical jargon. Acronyms reflect the diverse and vibrant discipline of mass spectrometry, but shorthand-speak can become common, and practitioners in one subdiscipline tend to become more isolated, even in conversation, from their colleagues in other areas. Researchers enjoy coining acronyms as much as the federal government, and our acronym-laden language can become intimidating. Additionally, a new acronym can rise to general use, or can be orphaned and its meaning lost. In this installment, we add more acronyms to the already extensive collection, culled from recent publications, proceedings, and web sites in the field of mass spectrometry. Inclusion of an acronym in this list is not explicitly an endorsement for its use by the community; the nomenclators eventually make their judgments, but the community itself enforces a certain discipline. Immortality in the annals of science is not to be gained by coining a new acronym; a truly useful acronym quickly becomes distributed so widely that its originator is forgotten, and even commercial trademark protection can be insufficient.

For some recent additions to the acronym list, a short description is provided, along with a recent (not necessarily the first) reference. Visit the reference given for a more complete description. Space constraints preclude extensive discussions here — but perhaps later in a future coffee-table book, when mass spectrometers themselves shrink to the same scale. Most acronyms are composed of uppercase letters, but a few traditionally are given as sequences of lowercase letters, or a mixture, and sometimes including punctuation, all to the consternation of spell-checkers, editors, and indexers everywhere. We retain acronyms in this list but not specialized nomenclature or abbreviations. If your favorite acronym is missing, if you would like to argue for an acronym's deletion, or to correct an error, please contact the author at [WyvernAssoc@yahoo.com](mailto:WyvernAssoc@yahoo.com).

<b>A</b>	Anion
<b>AA</b>	Amino acid
<b>ACMS</b>	Asilomar Conference on Mass Spectrometry
<b>ADC</b>	Analog-to-digital converter

<b>ADO</b>	Average dipole orientation
<b>AE</b>	Appearance energy
<b>AEI</b>	Associated Electric Industries, a past MS manufacturer
<b>AGC</b>	Automatic gain control
<b>AGHIS</b>	All-glass-heated-inlet system
<b>AMS</b>	Accelerator mass spectrometry; adolescent mass spectrometrists
<b>amu</b>	atomic mass unit
<b>AN</b>	Auger neutralization; application note (in JASMS)
<b>ANP</b>	2-amino-5-nitropyridine (a MALDI matrix)
<b>ANZSMS</b>	Australian and New Zealand Society for Mass Spectrometry
<b>AP</b>	Appearance potential; atmospheric pressure
<b>APCI</b>	Atmospheric pressure chemical ionization
<b>API</b>	Atmospheric-pressure ionization
<b>APPI</b>	Atmospheric-pressure photoionization
<b>AREX</b>	Axial resonant excitation
<b>ARMS</b>	Angle-resolved mass spectrometry
<b>ASGDIMS</b>	Atmospheric-sampling glow discharge ionization mass spectrometry
<b>ASMS</b>	American Society for Mass Spectrometry
<b>ASTM</b>	American Society for the Testing of Materials
<b>ATT</b>	6-Aza-2-thiothymine (a MALDI matrix)
<b>AVS</b>	Accelerating-voltage scan; American Vacuum Society
<b>B</b>	Magnetic sector mass analyzer, magnetic field; magnetic sector field strength or flux density
<b>BAMS</b>	Bioaerosol mass spectrometry
<b>BAT</b>	Best anode temperature
<b>BDE</b>	Bond dissociation energy
<b>B/E</b>	Linked scan for product ions in MS-MS
<b>B<sup>2</sup>E</b>	Linked scan for parent ions in MS-MS
<b>BEoQ</b>	A reverse-geometry sector instrument followed by an octupole collision cell followed by a quadrupole mass filter
<b>BEqQ</b>	A reverse-geometry sector instrument followed by a collision quadrupole followed by a quadrupole mass filter
<b>BEMS</b>	<i>Biomedical and Environmental Mass Spectrometry</i> (a former MS journal)
<b>BET</b>	Best emitter temperature
<b>BIAMS<sup>TM</sup></b>	Biomolecular interaction analysis mass spectrometry

- BIRD** Blackbody infrared radiative dissociation
- BMS** *Biomedical Mass Spectrometry; Biological Mass Spectrometry*
- BMSS** British Mass Spectrometry Society
- BNG** Bradbury–Nelson gate
- BrMASS** Brazilian Mass Spectrometry Society
- BSMS** Belgian Society for Mass Spectrometry
- BTEX** Benzene, toluene, ethylbenzene, and xylene
- c** “Conventional” collision cell
- C** Cation; coulomb; short communication in JASMS
- CA** Collisional activation
- CAD** Collisionally activated decomposition
- CAF** Chemically assisted fragmentation
- CCA**  $\alpha$ -Cyano-4-hydroxycinnamic acid (a MALDI matrix)
- CCE-ES** Controlled-current electrochemistry electrospray
- The electrospray ionization process is, at its core, an electrochemical process. As such, the insights and strategies developed over years of classical analytical electrochemistry can be brought to bear to generate additional sensitivity and specificity from the electrospray ionization. Many research workers are advancing this field. In this paper, oxidations and reductions of electrochemically active compounds are reflected in the positive and negative ion electrospray mass spectra. Because the current demands on the electrochemical system are small, relatively simple, battery-operated circuitry is devised to operate in conjunction with the electrospray source. See V. Kertesz and G.J. Van Berkel, *J. Amer. Soc. Mass Spectrom.* 17(7), 953–961 (2006).
- CDEM** Continuous-dynode electron multiplier
- CDNT** Conformation-dependent neutralization theory
- CE** Charge exchange; collision energy; capillary electrophoresis
- CEC** Consolidated Electric Corporation (a former MS manufacturer)
- CEMA** Channel electron-multiplier array
- cf** ConFlat™
- CFEAB** Continuous-flow fast atom bombardment
- CFP** Continuous flow probe
- CHCA** Cyano-4-hydroxycinnamic acid (a MALDI matrix)
- CI** Chemical ionization
- CID** Collision-induced dissociation
- CIDI** Collisionally induced dissociative ionization
- CIT** Cylindrical ion trap
- CM** Center-of-mass
- CMD** Carbohydrate membrane desalter
- CNL** Constant neutral loss
- CODA** Component detection algorithm
- COM** Center-of-mass
- COMSPARI** Comparison of spectral retention information
- CREMS** Charge-reduction electrospray mass spectrometry
- CRM** Charged residue model; certified reference material
- CS** Charge stripping
- CSMS** Canadian Society for Mass Spectrometry
- CV** Compensation voltage; cone voltage
- CX** Charge exchange
- CXP** Collision-cell exit potential
- CZE-MS** Capillary zone electrophoresis mass spectrometry
- D** Disproportionation factor; deuterium
- Da** Dalton
- DA** Dopant-assisted
- DAC** Digital-to-analog converter
- DADI** Direct analysis of daughter ions
- DAPCI** Desorption atmospheric-pressure chemical ionization
- DAR** Data-acquisition routine
- DART** Direct analysis in real time
- DB** Database
- dbe** Double-bond equivalent
- DCI** Desorption (or direct) chemical ionization
- DCI** Double charge transfer
- DCIB** *trans*-2-[3-{4-*tert*-Butylphenyl}-2-methyl-2-propenylidene] malononitrile (a MALDI matrix)
- DE** Delayed extraction
- DEI** Desorption (or direct) electron ionization
- DESI** Desorption electrospray ionization
- DF** Double focusing
- DFTPP** Decafluorotriphenylphosphine
- DHB** 2,5-Dihydroxybenzoic acid (a MALDI matrix)
- DI** Desorption ionization
- DIADS** Delimited ion abundance database search
- DIN** Direct injection nebulizer
- DIOSMS** Desorption ionization on silicon mass spectrometry
- DIP** Direct-insertion probe
- DLI** Direct liquid introduction
- DLV** Direct laser vaporization
- DMS** Differential mobility spectrometry
- DNFW** from the Latin for “Please do not mess with the instrument”
- DP** Direct probe; declustering potential; diffusion pump
- DPBD** Diphenyl butadiene (a MALDI matrix)
- DS** Data system
- DTIMS** Drift-tube ion mobility spectrometry
- E** Energy; electric sector
- EA** Electron affinity
- EAD** Electron avalanche desorption
- ECD** Electron-capture dissociation
- ECID** Electron-capture-induced dissociation
- ECMS** Electron-capture mass spectrometry
- ECNCI** Electron-capture negative chemical ionization
- ECNI** Electron-capture negative ionization
- A moderator gas used in a chemical ionization source decreases the energy of electrons emitted from a filament to energies sufficiently low that the electrons are captured by electrophilic compounds to form stable molecular

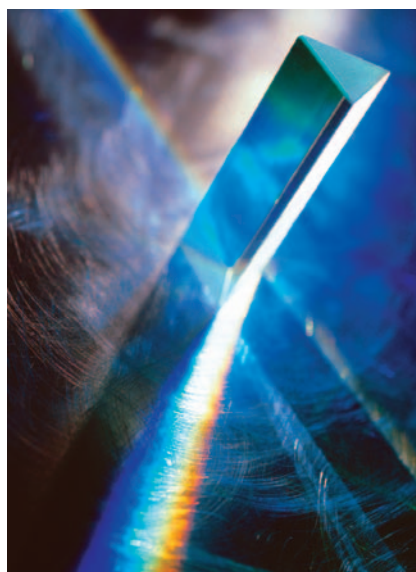
negative ions  $M^-$ . The electron-capture cross section can be increased with use of a proper electrophilic derivative. In this work, a pentafluorobenzoyl ester derivative is prepared of triclosan, a common antibacterial agent in consumer products. An analytical protocol for determination of this agent in plasma and milk samples is developed and validated. See M. Allmyr, M.S. McLachlan, G. Sandborgh-Englund, and M. Adolfsson-Erici, *Anal. Chem.* **78**(18), 6542–6546 (2006).

<b>ECP</b>	Emitter-current programmer
<b>EDD</b>	Energy-distribution difference
<b>EE</b>	Even-electron ion
<b>EED</b>	Electron excitation dissociation
<b>EHI</b>	Electrohydrodynamic ionization
<b>EI</b>	Electron ionization; electron impact
<b>EIEIO</b>	Electron-induced excitation of ions from organics
<b>EIS</b>	External ion source
<b>EJMS</b>	<i>European Journal of Mass Spectrometry</i>
<b>EM</b>	Electron multiplier
<b>EM-MS</b>	Electron monochromator mass spectrometry

An electron monochromator produces a well-defined source of electrons that can be used as part of an electron ionization source to create both positive and negative ions. Stable molecular negative ions are formed only for electrophilic compounds in the presence of low energy electrons, which can be produced by the electron monochromator. In this study, the authors use EM-MS to quantify three different dinitroaniline pesticides present in tobacco smoke. The pesticide residues derive from the farming practices used to produce the various tobacco products. See A.J. Dane, C.J. Havey, and K. Voorhees, *Anal. Chem.* **78**, 3227–3233 (2006).

<b>EMP</b>	Electron multiplier
<b>EOID</b>	Electro-optical ion detector
<b>EP</b>	Entrance potential
<b>EPD</b>	Electron photodetachment dissociation

Polyanions formed from DNA were stored in a QIT and irradiated with laser light. The irradiation caused electron loss from the polyanion to form a radical anion, and subsequent CID of the anion provided a MS-MS spectrum that provided good sequence information and a lack of internal cleavages. Preliminary work indicates that even noncovalent bonds of the DNA can be preserved through the initial electron photodetachment process. See V. Gabellica, T. Tabarin, R. Antoine, F. Rosu, I. Compagnon, M. Broyer, E. De Pauw, and P. Dugourd, *Anal. Chem.* **78**, 6564–6572 (2006).



<b>ERMS</b>	Energy-resolved mass spectrometry
<b>ES</b>	Electrospray; electrospray ionization
<b>ESA</b>	Electrostatic analyzer
<b>ESCI</b>	Combined electrospray and atmospheric pressure ionization source
<b>ESI</b>	Electrospray ionization
<b>ESMS</b>	European Society for Mass Spectrometry
<b>ESP</b>	Electrospray ionization
<b>ESPI</b>	Electrospray ionization
<b>esu</b>	Electrostatic unit
<b>ET</b>	Electron transfer
<b>ETD</b>	Electron-transfer dissociation
<b>ETV</b>	Electrothermal vaporization
<b>eV</b>	Electron volt
<b>FA</b>	Flowing afterglow; ferulic acid (a MALDI matrix)

<b>FAB</b>	Fast-atom bombardment
<b>FAIMS</b>	High-field asymmetric waveform ion mobility spectrometry
<b>FAME</b>	Fatty acid methyl ester
<b>FC</b>	Faraday cup
<b>FD</b>	Field desorption
<b>FFID</b>	Fission-fragment-induced desorption
<b>FFR</b>	Field-free region
<b>FI</b>	Field ionization
<b>FIA</b>	Flow-injection analysis
<b>FIB</b>	Fast-ion bombardment
<b>FID</b>	Free-induction decay
<b>FIK</b>	Field ionization kinetics
<b>FIMS</b>	Field-ionization mass spectrometry
<b>FNB</b>	Fast-neutral beam
<b>FRET</b>	Fluorescence resonance energy transfer
<b>FTICR</b>	Fourier-transform ion cyclotron resonance
<b>FTMS</b>	Fourier-transform mass spectrometry
<b>FT-TOF</b>	Fourier-transform time-of-flight mass spectrometry
<b>FWHH</b>	Full width at half height
<b>FWHM</b>	Full width at half maximum
<b>G</b>	Multiplier gain; glycerol (an LSIMS matrix)
<b>GC</b>	Gas chromatography
<b>GC-MS</b>	Gas chromatography–mass spectrometry
<b>GDMS</b>	Glow discharge mass spectrometry
<b>GEMIOS</b>	Gas and electromagnetic ion optical simulator
<b>GEMMA</b>	Gas-phase electrophoretic mobility molecular analysis
<b>GIANT</b>	Gas-phase ion and neutral thermochemistry (a published compilation of such data)
<b>GLP</b>	Good laboratory practice
<b>GPC</b>	Gel permeation chromatography
<b>HABA</b>	2-(4-Hydroxyphenylazo) benzoic acid (a MALDI matrix)
<b>HASTE</b>	High-amplitude short-time excitation
<b>4-HBSA</b>	4-Hydroxybenzenesulfonic acid (an LSIMS matrix)
<b>HCCA</b>	$\alpha$ -Cyano-4-hydroxycinnamic acid (a MALDI matrix)

**HCD** Heated capillary dissociation  
**HCP** Hollow cathode plume  
**H/D** Hydrogen–deuterium  
**HDX** Hydrogen–deuterium exchange  
**HE** High energy  
**HECD** Hot electron capture dissociation  
**2-HEDS** 2-Hydroxyethyl disulfide (an LSIMS matrix)  
**HILIC** Hydrophilic interaction liquid chromatography  
**HKSMS** Hong Kong Society for Mass Spectrometry  
**HMM** High molecular mass  
**HPA** 3-Hydroxypicolinic acid (a MALDI matrix)  
**2-HPEA** 2-Hydroxyphenethyl alcohol (an LSIMS matrix)  
**HPMS** High-pressure mass spectrometer  
**HRMS** High-resolution mass spectrometry  
**HSI** Hyperthermal surface ionization  
**HSMS** Headspace mass spectrometry  
**HT** Hadamard transform; high tension, which is a Britishism for HV (high voltage)  
**HTMS** High temperature mass spectrometry  
**HT-TOFMS** Hadamard transform time-of-flight mass spectrometry  
**HV** High voltage  
**HXMS** Hydrogen–deuterium exchange mass spectrometry  
**IAA** Indole acrylic acid (a MALDI matrix)  
**IC** Ion chromatography  
**ICAT** Isotope-coded affinity tag  
**ICDR** Ion cyclotron double resonance  
**ICEMS** Ion-pair liquid chromatography electrospray ionization mass spectrometry  
**IC-MS** Ion chromatography–mass spectrometry  
**ICP-MS** Inductively coupled plasma–mass spectrometry  
**ICR** Ion cyclotron resonance  
**IDMS** Isotope dilution mass spectrometry  
**IE** Ionization energy; ionizing energy; ion evaporation

**IELC** Ion-exchange liquid chromatography  
**IJMSIP** *International Journal of Mass Spectrometry and Ion Physics* (volumes 1–62)  
*International Journal of Mass Spectrometry and Ion Processes* (after volume 62)  
**IJMS** *International Journal of Mass Spectrometry*  
**IKE(S)** Ion kinetic energy (spectrometry)  
**IMAC** Immobilized metal affinity chromatography  
**IMS** Ion mobility spectrometry; imaging mass spectrometry

Imaging mass spectrometry based on MALDI uses mass spectra convoluted with planar ( $x, y$ ) coordinates to provide spatial tracking of both endogenous and exogenous compounds with spatial resolution and molecular specificity. In this work, the authors track drug and drug metabolite distributions within whole-body tissue sections. When the tissue sections are sampled in time, the temporal distributions also can be established. This work is one example of a rapidly growing area of application. See S. Khatib-Shahidi, M. Andersson, J.L. Herman, T.A. Gillespie, and R.M. Caprioli, *Anal. Chem.* 78, 6448–6456 (2006).

**IMSS** International Mass Spectrometry Society; Irish Mass Spectrometry Society  
**INC** Ion-neutral complex

**IP** Ionization potential  
**IPD** Ion-photon detector  
**IRMPD** Infrared multiphoton dissociation  
**IRMS** Isotope ratio mass spectrometry  
**ISD** In-source decay  
**ISMAS** Indian Society for Mass Spectrometry  
**ISP** Ionspray  
**ISR** Ion–surface reaction  
**ITD™** Ion-trap detector  
**ITMS** Ion-trap mass spectrometry  
**ITPMS** Isotacophoresis mass spectrometry  
**IUPAC** International Union of Pure and Applied Chemistry  
**JASMS** *Journal of the American Society for Mass Spectrometry*  
**JEOL** Japan Electro-Optics Laboratory  
**JMS** *Journal of Mass Spectrometry*  
**K** Kelvin  
**KCMS** Knudsen cell mass spectrometry  
**kDa** Kilodalton  
**KERD** Kinetic energy release distribution  
**K•IDS** Potassium ion desorption spectrometry  
**KM** Kinetic method  
**KNN** K-nearest neighbor  
**L** Length (of flight tube)  
**LA** Laser ablation

While MALDI is used for biological



analyses, the direct impact of a laser on a surface such as a silicate glass produces a vaporized aerosol that can then be directed into an ICP-MS system for elemental analysis. For the ICP-MS system to provide an accurate analysis, the vaporization and transfer efficiency must be mass- and element-independent. This ideal case is not achieved in practice, and the authors of this careful work on laser ablation study two different laser ablation systems, and different carrier gases, as means of sample introduction in ICP-MS. See Z. Wang, B. Hattendorf, and D. Gunther, *J. Amer. Soc. Mass Spectrom.* 17(5), 641–651 (2006).



**LAMMA™** Laser microprobe mass analyzer

**LAMPAS** Laser mass analyzer for particles in the airborne state

**LBO** Light beam oscillograph

**LC-MS** Liquid chromatography–mass spectrometry

**LD** Laser desorption

**LDI** Laser desorption ionization

**LDLP** Laser desorption–laser photoionization

**LE** Low energy

**LI** Liquid ionization

**LIAD** Laser-induced acoustic desorption

**LIMA™** Laser ionization mass analyzer; laser ion microprobe analyzer

**LIT** Linear ion trap

**LMCO** Low mass cut-off

**LMM** Low molecular mass

**LMMS** Laser microprobe mass spectrometer

**LMS** Laser mass spectrometry

**LMW** Low molecular weight

**LOD** Limit of detection

**LOQ** Limit of quantification

**LRB** Laboratory reagent blank

**LSIMS** Liquid matrix secondary ion mass spectrometry

**LTOF** Laser time-of-flight; linear time-of-flight

**LV/EI** Low voltage electron ionization

**m** Mass of the ion in units of u

**M/A** Matrix/analyte ratio

**MAGIC** Monodisperse aerosol generator interface to

chromatography

**MALD** Matrix-assisted laser desorption

**MALDI** Matrix-assisted laser desorption ionization

**MAPS** Method for analyzing patterns in spectra

**MB** Molecular beam

**MBMS** Molecular beam mass spectrometry

**MCA** Multichannel analyzer

**MCI** Massive cluster impact

**MCMS** Midwest Center for Mass Spectrometry

**MCP** Microchannel plate (detector)

**MCPD** Microchannel plate detector

**MEND** Matched filtration with experimental noise determination

**MDMS** Microdialysis mass spectrometry

**MDL** Method detection limit

**MELDI** Material-enhanced laser desorption–ionization

The authors describe various functionalized carrier materials (listing cellulose, silica, a glycidyl methacrylate–divinylbenzene polymer, and diamond powder) that act as matrices for a relatively conventional MALDI-TOF analysis. The advantages of MELDI include the high capacity and selective functionality useful in binding serum constituents to be analyzed. The spectral effects of particle shape and pore size were delineated; highly porous spherical particles with diameters of a

few micrometers were shown to provide superior mass spectra. See I. Feuerstein, M. Najam-ul-Huq, M. Rainer, L. Trojer, R. Bakry, N.H. Aprilita, G. Stecher, C. Huck, H. Klocker, G. Bartsch, A. Guttman, and G.K. Bonn, *J. Amer. Soc. Mass Spectrom.* 17(9), 1203–1208 (2006).

**MESIMS** Matrix-enhanced secondary ion mass spectrometry

**MI** Metastable ion

**MID** Multiple ion detection

**MIKE(S)** Mass-analyzed ion kinetic energy (spectrometry)

**MIM** Multiple ion monitoring

A lowered limit of detection can be achieved in mass spectrometric analyses with the use of selected ion monitoring; monitoring the intensities of several ions in time (for instance, as mixture components are eluted from a gas chromatograph) is called multiple ion monitoring. Early work suggested that monitoring ions of three different selected masses should be sufficient to confirm the presence of a targeted compound. However, using an expanded library of 100,000 electron ionization mass spectra, and more generalized restraints on the relative intensities of ions in the standard mass spectra of the targeted compound, recent work suggests that additional ions may need to be monitored and the potential for false positives reassessed. See S.E. Stein and D.N. Heller, *J. Amer. Soc. Mass Spectrom.* 17(6), 823–835 (2006).

<b>MIMS</b>	Membrane introduction mass spectrometry
<b>MIP</b>	Microwave-induced plasma
<b>MNBA</b>	<i>m</i> -Nitrobenzyl alcohol, an LSIMS matrix
<b>MNDO</b>	Modified neglect of differential overlap
<b>MO</b>	Molecular orbital
<b>MOWSE</b>	Molecular weight search
<b>MPD</b>	Multiphoton dissociation
<b>MPI</b>	Multiphoton ionization
<b>MPM</b>	Multiple peak monitoring
<b>MQDT</b>	Multichannel quantum defect theory
<b>MRM</b>	Multiple reaction monitoring
<b>MS<sup>n</sup></b>	If $n = 2$ , MS-MS. If $n = 3$ , MS-MS-MS. Repeat as necessary.
<b>MSB</b>	<i>Mass Spectrometry Bulletin</i>
<b>MSD</b>	Mass-selective detector
<b>MSDC</b>	Mass Spectrometry Data Center
<b>MSE</b>	Matrix suppression effect

An electrospray sample deposition technique was used to deposit matrix-analyte solutions of varying thickness onto a surface then analyzed by MALDI mass spectrometry. A matrix suppression effect score was calculated by dividing a standard analyte ion response by the sum of the analyte and matrix ion responses for the samples of varying thickness. The matrix suppression is therefore a measure of how the matrix signal could be reduced relative to a persistent analyte ion signal. The well-known "first shot" effect could be

observed in this work, and the results that showed an enhancement in matrix suppression effect with thinner layers considered in terms of a model that considers a first-step ionization of the matrix, enhanced in the near vicinity of the metal surface. See G. McCombie and R. Knochenmuss, *J. Amer. Soc. Mass Spectrom.* 17(5), 737–745 (2006).

<b>MSM</b>	Multiple scattering method
<b>MSR</b>	<i>Mass Spectrometry Reviews</i>
<b>MS-MS</b>	Mass spectrometry-mass spectrometry
<b>MSSJ</b>	The Mass Spectrometry Society of Japan
<b>MSSS</b>	Mass spectral search system

The first mass spectral database used for organic compound identification was developed at NIH and used a system called the MSSS. It was implemented on a PDP-10 computer and was first described in the journal *Analytical Chemistry* in 1972. The first dial-up connection to the mainframe computer used a 110-baud modem. Feeling old yet? See S.R. Heller, *Today's Chemist at Work* 8(2), 45–46, 49–50 (1999).

<b>MULTUM</b>	Multiturn mass spectrometer
<b>MW</b>	Molecular weight
<b>Mwt</b>	Molecular weight
<b>N</b>	Neutral molecule or species
<b>NBA</b>	<i>m</i> -Nitrobenzyl alcohol (an LSIMS matrix)
<b>NCBI</b>	National Center for

<b>NCE</b>	Normalized collision energy
<b>NCI</b>	Negative ion chemical ionization
<b>NET</b>	Normalized elution time
<b>NI</b>	Negative ion
<b>NICI</b>	Negative ion chemical ionization
<b>NOBA</b>	<i>m</i> -Nitrobenzyl alcohol (an LSIMS matrix)
<b>*NR+</b>	Neutralization reionization; a positive ion is neutralized and then reionized
<b>NRMS</b>	Neutralization reionization mass spectrometry
<b>NSI</b>	Nanospray ionization
<b>NSMS</b>	Norwegian Society for Mass Spectrometry
<b>NVMS</b>	Dutch Society for Mass Spectrometry
<b>o</b>	Orthogonal
<b>oa</b>	Orthogonal acceleration
<b>ODN</b>	Oligodeoxynucleotide
<b>OE</b>	Odd-electron ion
<b>OMS</b>	<i>Organic Mass Spectrometry</i>
<b>oTOF</b>	Orthogonal (source) time-of-flight
<b>PA</b>	Proton affinity
<b>PAD</b>	Postacceleration detector
<b>PAI</b>	Postablation ionization
<b>PALMS</b>	Particle analysis by laser mass spectrometry
<b>PBM</b>	Probability-based matching
<b>PBMS</b>	Particle-beam mass spectrometry
<b>PCA</b>	Principal component analysis
<b>PCI</b>	Positive ion chemical ionization
<b>P<sup>2</sup>CID</b>	Parallel collision-induced dissociation



A quadrupole-time-of-flight mass spectrometer is used to generate MS-MS spectra with higher signals than a single collision-induced dissociation (CID) process. A higher cone voltage is used to effect source CID, and then these energized ions are passed into a collision cell, where a second CID process ensues. The authors claim a two- to fourfold increase in the product ion intensities observed for higher mass ions, which increases, for example, the intensities of structurally informative sequence ions from pep-



tides. See A.A. Ramos, H. Yang, L.E. Rosen, and X. Yao, *Anal. Chem.* 78(18), 6391–6397 (2006).

**PCR** Polymerase chain reaction  
**PD** Plasma desorption; photodissociation  
**PDF** Pulsed dynamic focusing  
**PDMS** Plasma desorption mass spectrometry  
**PEPICO** Photoelectron-photoion coincidence spectroscopy  
**PES** Photoelectron spectroscopy  
**PFK** Perfluorokerosene  
**PFT** Porous flow-through (electrode)  
**PFTBA** Perfluorotributylamine  
**PHD** Pulse height distribution  
**PHT** Peptide hits technique  
**PI** Positive ion  
**PID** Particle-induced desorption; photon-induced dissociation  
**PIE** Photoionization efficiency  
**PIT** Protein-identification technology  
**PIT-MS** Proton-transfer ion-trap mass spectrometry  
**PIPECO** Photoion-photoelectron coincidence spectroscopy  
**PLE** Pressurized liquid extraction  
**PMF** Peptide mass fingerprinting  
**PMM** Peptide mass maps  
**PMS** Parallel mass spectrometry  
**PPINICI<sup>TM</sup>** Pulsed positive-ion negative-ion chemical ionization  
**ppm** Part per million  
**PSD** Postsource decay  
**PSI** Pulsed sample introduction

**PSM** Peptide-spectrum match  
**PSPF** Postsource pulse focusing  
**PTM** Posttranslational modification  
**PTR** Proton-transfer reaction  
**PTSM** Polish Society for Mass Spectrometry  
**PyMS** Pyrolysis mass spectrometry  
**q** Quadrupole device used in rf-only mode as a collision cell  
**Q** Quadrupole mass filter  
**Q** Reaction endothermicity  
**QA** Quality assurance  
**QC** Quality control  
**qCID** Collision-induced dissociation accomplished within an rf-only quadrupole  
**QCPE** Quantum Chemistry Program Exchange  
**QET** Quasi-equilibrium theory  
**QFTMS** Quadrupole Fourier-transform mass spectrometry  
**QIT** Quadrupole ion trap  
**QLT** Quadrupole linear ion trap  
**QTOF** Quadrupole followed by a time-of-flight mass analyzer  
**QUISTOR** Quadrupole ion storage trap  
**r** radius of electric or magnetic sector  
**RA** Relative abundance; *trans,trans*-retinoic acid (a MALDI matrix)  
**RCM** *Rapid Communications in Mass Spectrometry*  
**rdbe** Rings plus double bonds equivalent  
**REE** Rare earth elements

**REMPI** Resonance-enhanced multiphoton ionization  
**rf** Radio frequency; Response factors  
**RGA** Residual gas analyzer  
**RI** Relative intensity  
**RIMS** Resonance-ionization mass spectrometry  
**RiT** Rectilinear ion trap  
**RLCT** Rayleigh limiting charge theory  
**RN** Resonance neutralization  
**ROOMS** Regular old ordinary mass spectrometry  
**R2PI** Resonant two-photon ionization  
**RP** Resolving power  
**RPD** Retarding potential difference  
**RPLC** Reversed-phase liquid chromatography  
**RRKM** Rice, Ramsperger, Kassel, and Marcus  
**RSMS** Rapid single particle mass spectrometer  
**rTOF** Reflectron time-of-flight  
**SA** Sinapinic acid (a MALDI matrix)  
**SAAMS** South African Association for Mass Spectrometry  
**SCMS** Sanibel Conference on Mass Spectrometry  
**SCX** Strong cation exchange  
**SDM** Selected dissociation monitoring  
**SDME** Single-drop microextraction  
**SEAC** Surface-enhanced affinity capture  
**SEC** Size exclusion chromatography  
**SEEM** Spanish Society for Mass Spectrometry  
**SELDI** Surface-enhanced laser desorption ionization  
**SEND** Surface-enhanced neat desorption  
**SFC-MS** Supercritical fluid chromatography–mass spectrometry  
**SFE** Supercritical fluid extraction  
**SFSM** French Society for Mass Spectrometry  
**SGMS** Swiss Group for Mass Spectrometry  
**SI** Spray ionization; surface ionization  
**SID** Surface-induced dissociation

<b>SIFDT</b>	Selected ion flow drift tube		moment theory		spectrometry; thermospray mass spectrometry
<b>SIFT</b>	Selected ion flow tube	<b>SWIFT</b>	Stored-waveform inverse Fourier transform	<b>ToF</b>	Time-of-flight
<b>SILVER</b>	Spectrum intensity likelihood viewer	<b>SWIM</b>	Stored waveform ion modulation	<b>TOF</b>	Time-of-flight
<b>SIM</b>	Selected-ion monitoring			<b>TOFMS</b>	Time-of-flight mass spectrometry
<b>SIMBROC</b>	Simulated background and reduction/oxidation calculations	<b>f</b>	Ion flight time; time	<b>TQ</b>	Triple quadrupole
		<b>T</b>	Tesla	<b>TQMS</b>	Triple-quadrupole mass spectrometry
<b>SIMS</b>	Secondary ion mass spectrometry	<b>TAC</b>	Time-to-amplitude converter	<b>TRPD</b>	Time-resolved photodissociation
<b>SIN</b>	Surface-induced neutralization	<b>TAMS</b>	Tandem accelerator mass spectrometry	<b>TS</b>	Transition state; transition structure
<b>SIOMS</b>	Surface ionization organic mass spectrometry	<b>TDC</b>	Time-to-digital converter	<b>TSP</b>	Thermospray
<b>SIR</b>	Selected-ion recording	<b>TDMS</b>	Thermal desorption mass spectrometry	<b>TSQ™</b>	Triple-stage quadrupole
<b>SIRMS</b>	Stable-isotope-ratio mass spectrometry	<b>TEL</b>	Translational energy loss	<b>u</b>	Mass unit (1/12 of the mass of <sup>12</sup> C), now replaced by dalton
<b>SMB</b>	Supersonic molecular beam	<b>TEPSICO</b>	Threshold electron photoion secondary ion coincidence	<b>UULD</b>	Ultraviolet laser desorption
<b>SMOKE</b>	Stored modulation of kinetic energy	<b>TES</b>	Translational energy spectroscopy	<b>UVPD</b>	Ultraviolet photodissociation
<b>SMOW</b>	Standard mean ocean water	<b>TGAMS</b>	Thermogravimetric analysis mass spectrometry		
<b>SMSS</b>	Swedish Society for Mass Spectrometry	<b>TG GC-MS</b>	Thermogravimetry gas chromatography–mass spectrometry	<b>v</b>	Ion velocity
<b>S/N</b>	Signal-to-noise ratio	<b>THAP</b>	2,4,6-Trihydroxyacetophenone (a MALDI matrix)	<b>V</b>	Accelerating voltage
<b>SOMO</b>	Singly occupied molecular orbital	<b>TI</b>	Thermal ionization	<b>VG</b>	Vacuum Generators, former name of a manufacturer of mass spectrometers
<b>SPE</b>	Solid-phase extraction	<b>TIC</b>	Total ion current	<b>VOC</b>	Volatile organic compound
<b>SPME</b>	Solid-phase microextraction	<b>TID</b>	Trapped-ion detector; thermally induced dissociation	<b>VMSOW</b>	Vienna mean standard ocean water
<b>SRBC</b>	Simulated reduction and background calculations	<b>TIMS</b>	Thermal-ionization mass spectrometry	<b>VTST</b>	Variational transition state theory
<b>SRM</b>	Selected reaction monitoring; standard reference material	<b>TISI</b>	Turbo ionspray ionization	<b>W</b>	Wien filter
<b>SSIMS</b>	Static secondary-ion mass spectrometry	<b>TIP™</b>	True isotopic pattern	<b>z</b>	Charge state of the ion in units of the electric charge
<b>SSMS</b>	Spark source mass spectrometry	<b>TLC-MS</b>	Thin layer chromatography–mass spectrometry	<b>ZPE</b>	Zero-point vibrational energy
<b>STIRS</b>	Self-training interpretive and retrieval system	<b>TMS</b>	Trimethylsilyl; tandem mass		
<b>STMT</b>	Stieltjes–Tchebycheff				



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During those 15 years, mass spectrometry has been reinvented, reconfigured, redirected, and submerged in acronyms. Slang and jargon in mass spectrometry is a separate issue that will be tackled ASAP. The contents of this article represent the views of the author (MHOs), and not those of the National Science Foundation (NSF). KLB can be reached at [WyvernAssoc@yahoo.com](mailto:WyvernAssoc@yahoo.com).