CPC field-specific training

H01J49: Particle spectrometers
Agenda

▪ **Introduction – Definitions**

▪ H01J49 Scheme

▪ Examples, Special rules of classification

▪ What is _not_ classified in H01J49: neighbouring fields

▪ Conclusion
Introduction – Definitions
Definition

- **H** Section - ELECTRICITY
  - **H01** Class – Basic electric elements
    - **H01J** Subclass – Electric discharge tubes
      - **H01J49** Main Group – Particle spectrometer or separator tubes

  *Definition statement – This group covers:* Instruments arranged to generate a spectrum of charged particles according to their mass-to-charge ratio (mass spectrometers), or according to their kinetic energy (energy spectrometers)

- Abbreviated form: 49/04 is used as a shortcut for **H01J49/04**
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- **H01J49 Scheme**
- Examples, Special rules of classification
- What is _not_ classified in H01J49: neighbouring fields
- Conclusion
## H01J49 Scheme
### IPC vs. CPC

<table>
<thead>
<tr>
<th>IPC</th>
<th>CPC</th>
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<tbody>
<tr>
<td>▪ 24 sub-groups</td>
<td>▪ 131 sub-groups</td>
</tr>
<tr>
<td>▪ classified by all patent offices</td>
<td>▪ classified by <strong>EPO classifier</strong> (now also by other CPC offices)</td>
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</table>

- 58% of documents classified in IPC H01J49/00 are classified in CPC.
H01J49 Scheme
Vertical groups (IPC H01J49/00)

- 49/0004 Imaging particle spectrometry
- 49/0009 Calibration of the apparatus
- 49/0013 Miniaturised spectrometers (Microminiaturised)
- 49/0022 Portable spectrometers
- 49/0027 Methods for using particle spectrometers
  - 49/0031 Step by step use of the apparatus
  - 49/0036 Data processing
- 49/004 Combinations of spectrometers, tandem spectrometers
  - 49/0045 Characterised by the fragmentation or other reaction
  - 49/0081 Tandem in time, i.e. using a single spectrometer
  - 49/009 With multiple channels, parallel analysis
- 49/0095 Generating or analysing both positive and negative ions
H01J49 Scheme
Details (IPC H01J49/02 - H01J49/24)

- 49/022 Circuit arrangements; High voltage power supplies
- 49/025 Detectors specially adapted to particle spectrometers
- 49/04 Introducing or extracting samples to be analysed
  - Sample holders; vacuum locks
  - for gaseous, liquid or solid samples
- 49/06 Electron- or ion-optical arrangements
- 49/08 Electron sources
- 49/10 Ion sources; Ion guns
  - Electron impact; Electrospray; MALDI
- 49/24 Vacuum systems, e.g. maintaining desired pressures
H01J49 Scheme
Kinds of spectrometers (IPC H01J49/26 - H01J49/48)

- 49/26  Mass spectrometers or separator tubes
  - 49/28  Static spectrometers
  - 49/34  Dynamic spectrometers
    - 49/36  Radio frequency spectrometers
    - 49/38  Omegatrons, using ion cyclotron resonance [ICR]
  - 49/40  Time-of-flight [TOF] spectrometers
  - 49/42  Stability-of-path spectrometers, e.g. quadrupoles

- 49/44  Energy spectrometers
  - 49/443  Dynamic spectrometers
  - 49/46  Static spectrometers
  - 49/48  Using electrostatic analysers
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Examples, Special rules of classification

Example 1: US 7 217 922

- Planar micro-miniature ion trap devices
- This is a ...
  - micro-miniaturised H01J49/0018
  - three-dimensional quadrupole ion trap H01J49/424

Rule 1:
For classification, focus on the main aspect(s) of the invention
Examples, Special rules of classification
Example 2: US 6 717 130

Methods and apparatus for mass spectrometry

This is all about fragmentation, thus H01J49/0045

Do not classify this in 49/40, 49/42 etc.

Rule 2: do not classify the standard features

(57) ABSTRACT
A method is disclosed of identifying parent ions by matching daughter ions found to be produced at substantially the same time that the parent ions elute from a mixture. Ions emitted from an ion source are incident upon a collision cell which alternately and repeatedly switches between a first mode wherein the ions are substantially fragmented to produce daughter ions and a second mode wherein the ions are not substantially fragmented. Mass spectra are taken in both modes, and at the end of an experimental run parent and daughter ions are recognized by comparing the mass spectra obtained in the two different modes. Daughter ions are matched to particular parent ions on the basis of the closeness of fit of their elution times, and this enables parent ions to then be identified.
Classification symbols "invention information" should be allocated only to features or aspects peculiar to the invention. Further elements described as conventional should not be classified (Rules 1 & 2).

Example:
A particular combination of an electrospray ion source (49/165) with a quadrupole ion guide (49/063) should be classified in both 49/165 and 49/063.

However, a particular electrospray ion source followed by either an ion guide, a capillary or a skimmer should be classified only in 49/165.
Examples, Special rules of classification
Symbols "additional information"

► Rule 3: classification symbols "additional information" should be allocated for the documents where the use of a particle spectrometer is an essential feature of an invention, but where a conventional instrument is used. In this case the allocation of a further code "invention information" (possibly in another technical field) is compulsory.

Example:
A method of protein analysis includes an essential step of analysis by a standard time-of-flight mass spectrometer.

H01J49/40 should be allocated as additional information, and the document should be classified in G01N33/6848
Examples, Special rules of classification

Example 3: US 2011/0294153 A1

- Liquid chromatography coupled to electrospray ionization tandem mass spectrometry (LC/ESI-MS/MS) has emerged as a powerful method [...] 
- For reasons that are not well understood, cations generally form gaseous ions better than anions in the electrospray ionization source of the mass spectrometer. 
- [...] a need exists to improve the LC/ESI-MS/MS sensitivity of detection of these lipid mediators 
- Claim 1: A method for derivatizing a carboxylic acid, comprising [...] 
- Claim 4: A method for measuring the mass spectrum of a carboxylic acid derivative, comprising: 
  (a) preparing an amide derivative having [...] 
  (b) measuring the mass spectrum of the amide derivative 
- Dependent claim 7: electrospray ionization mass spectrometry
Examples, Special rules of classification

Example 3: US 2011/0294153 A1

Bibliographic data: US2011294153 (A1) — 2011-12-01

REAGENT AND METHOD FOR DETECTION OF CARBOXYLIC ACIDS BY MASS SPECTROMETRY

Page bookmark | US2011294153 (A1) - REAGENT AND METHOD FOR DETECTION OF CARBOXYLIC ACIDS BY MASS SPECTROMETRY
Inventor(s): | GELB MICHAEL H [US]; TURECEK FRANTISEK [US]; BOLLINGER JAMES [US]
Applicant(s): | GELB MICHAEL H [US]; TURECEK FRANTISEK [US]; BOLLINGER JAMES [US]; UNIV WASHINGTON [US]
Classification: | - international: C07D213/20; C12Q1/02; G01N33/00
              | - cooperative: C07D213/20; G01N33/08; G01N33/92; H01J49/165; Y10T436/174614

- CCI (Invention information) in bold font
- CCA (Additional information) in normal font
Examples, Special rules of classification

Tip: Check the CPC Definitions

- H01J 49/0409 [Sample holders or containers (containers for retaining a material to be analyzed, B01L 3/50, for DNA, C12Q 1/6834, for biological materials, G01N 33/543)]
- H01J 49/0413 [for automated handling]
- H01J 49/0418 [for laser desorption, e.g. matrix-assisted laser desorption/ionisation (MALDI), surface enhanced laser desorption/ionisation (SELDI) plates]

Definitions

Definition statement
This place covers:

e.g. WO200706164
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What is not classified in H01J49?

Neighbouring fields

- **Optical** spectrometers
- Ion mobility spectrometers
- Chromatography
- Electrophoresis
- Sample preparation per se
- Data processing per se
- Bio-informatics, Chemo-informatics
  → see the **References in the CPC Definitions**
Neighbouring fields
Ion mobility spectrometers

US 4 855 595
- Ion Mobility Spectrometer (IMS)
- G01N27/622

US 6 512 224
- Field Asymmetric Ion Mobility Spectrometer (FAIMS)
- G01N27/624
Neighbouring fields
Methods of protein analysis

US 2012/0046185 A1
Panel of biomarkers for ovarian cancer

- Claim 1: A method for qualifying ovarian cancer status in a subject comprising:
  
  (a) determining the level of biomarkers in a biological sample from the subject, wherein the biomarkers comprise \([\text{beta}]-2\)-microglobulin, [...], fragments thereof, or a combination thereof; and
  
  (b) comparing the level of the biomarkers to a reference.

- Claim 9: The method of claim 1, wherein the level of the biomarkers is determined by immunoassay, (nucleic acid or protein) biochip array, mass spectrometry, or a combination thereof.

- G01N33/57449 but not in H01J49
What is not classified in H01J49?

Neighbouring fields

BUT:
if there is a **peculiar aspect** concerning the mass spectrometer, then **both codes** must be allocated
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Summary of classification rules

- **Rule 1:** for classification, focus on the **main aspect(s)** of the invention

- **Rule 2:** do **not** classify the **standard, replaceable** features

- **Rule 3:** classification symbols **"additional information"** should be allocated for the documents:
  - where the use of a particle spectrometer is an **essential feature** of an invention,
  - **but** where a **conventional instrument** is used.
Supplementary information

- **CPC Scheme, Definitions, Training material**
  www.cpcinfo.org

- **Search CPC by symbol or keyword**
  worldwide.espacenet.com/classification?

- **Guide to the IPC**

- **Guide to the CPC**
  www.cooperativepatentclassification.org/publications/GuideToTheCPC.pdf
Conclusion

*Always keep in mind when classifying:*

The purpose of classification is to **retrieve easily and quickly documents** according to their technical teaching.