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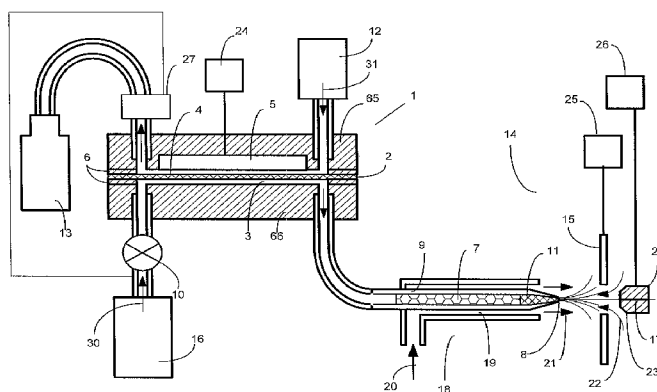
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(54) Title: SAMPLE COMPONENT TRAPPING, RELEASE, AND SEPARATION WITH MEMBRANE ASSEMBLIES INTERFACED TO ELECTROSPRAY MASS SPECTROMETRY



(57) Abstract: The invention provides a method and apparatus for trapping, releasing and/or separating sample components in solution passing through a channel with or without packing material present by passing ion current through the channel driven by an electric field. A portion of the ion current comprises cation and/or anion species generated from second solution flows separated from the sample solution flow path by semipermeable membranes. Cation and/or Anion ion species generated in the second solution flow regions are transferred into the sample solution flow path through ion selective semipermeable membranes. Ion current moving along the sample solution flow path is controlled by varying the composition of the second solutions and/or changing the voltage between membrane sections for a given sample solution composition. The sample composition may also be varied separately or in parallel to enhance trapping, release and/or separation efficiency and range. The invention when interfaced to an Atmospheric Pressure Ion Source, that may include Electrospray Ionization, with mass spectrometric analysis enables independent control of the on-line sample separation process and the Atmospheric Pressure Ion Source or Electrospray ionization processes.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 07/18798

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - B01D 57/02 (2007.10)

USPC - 204/451; 204/601

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)

USPC: 204/451; 204/601

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC: 250/288, 423R; 210/638 (text search)

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

PubWEST(USPT,PGPB,EPAB,JPAB); DialogPRO(Engineering); Google Scholar

Search Terms Used: analysis, chemical, species, mass to charge ratio, membrane, semi-permeable membrane, electrode, voltage, ion source, cation, anion, channel, column, chromatography, capillary electrophoresis

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X ----- Y	US 2005/0258360 A1 (WHITEHOUSE et al.) 24 November 2005 (24.11.2005); see fig 1 and 17; para [0046]-[005], [0060], [0076]-[0077].	1-9, 11-17, 19-25 ----- 10, 18
Y	US 2005/0284762 A1 (ASTORGA-WELLS et al.) 29 December 2005 (29.12.2005); see abstract; para [0037], [0054]-[0061], [0155].	10, 18
A	US 2005/0051485 A1 (SAINI) 10 March 2005 (10.03.2005); see abstract; para [0018]-[0022].	1
A	US 6,685,809 B1 (JACOBSON et al.) 03 February 2004 (03.02.2004); see abstract; col 2, ln 45 to col 3, ln 20.	1, 6-10

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"&" document member of the same patent family

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