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[Continued on next page]

(54) Title: MICROFLUIDIC RADIOSYNTHESIS OF A RADIOLABELED COMPOUND USING ELECTROCHEMICAL TRAPPING AND RELEASE

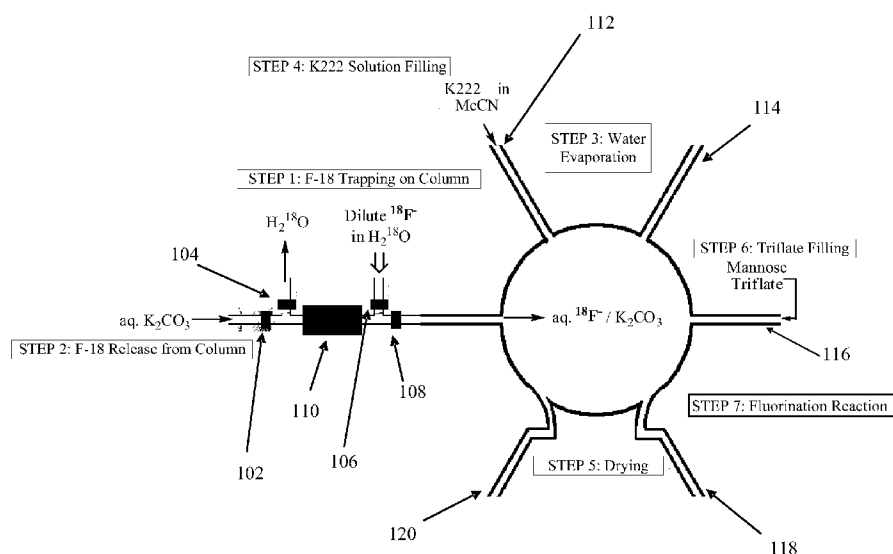


FIG. 1

(57) Abstract: Methods and apparatus enable radiosynthesis of radiolabeled compounds using electrochemical trapping and release. The trapping and release of radioactive isotopes all occur inside a microreactor, a vial or similar device, thus eliminating the need for azeotropic drying and several dead-end filling steps, as well as the necessity to move concentrated radioisotopes from one compartment of the chip to another. These and other features allow radioisotope enrichment to be carried out internally within a radiochemical synthesis chip, providing faster and more robust operation, as well as producing very high radiochemical labeling yields.

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INTERNATIONAL SEARCH REPORT

International application No

PCT/US2008/070558

A. CLASSIFICATION OF SUBJECT MATTER
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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)

C07B B01D

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, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	HAMACHER ET AL: "No-carrier-added nucleophilic ^{18}F-labelling in an electrochemical cell exemplified by the routine production of [^{18}F]altanserin" APPLIED RADIATION AND ISOTOPES, ELSEVIER, OXFORD, GB, vol. 64, no. 9, 1 September 2006 (2006-09-01), pages 989-994, XP005585764 ISSN: 0969-8043 the whole document ----- -/--	1-48



Further documents are listed in the continuation of Box C.



See patent family 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

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INTERNATIONAL SEARCH REPORT

International application No

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	HAMACHER K ET AL: "Electrochemical cell for separation of [^{18}F]fluoride from irradiated ^{18}O -water and subsequent no carrier added nucleophilic fluorination" APPLIED RADIATION AND ISOTOPES, ELSEVIER, OXFORD, GB, vol. 56, no. 3, 1 March 2002 (2002-03-01), pages 519-523, XP004333857 ISSN: 0969-8043 the whole document	1-48
A	ALEXOFF D ET AL: "RECOVERY OF [^{18}F]FLUORIDE FROM [^{18}O]WATER IN AN ELECTROCHEMICAL CELL" APPLIED RADIATION AND ISOTOPES, ELSEVIER, OXFORD, GB, vol. 40, no. 1, 1 January 1989 (1989-01-01), pages 1-6, XP002452268 ISSN: 0969-8043 the whole document	1-48

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2008/070558

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers allsearchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search reportcovers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-29

Method for the synthesis of a radiolabeled compound

2. claims: 30-48

Apparatus for electrochemically trapping a radioactive isotope reacting it with a substrate
