

Search query (2): [SP]: 1. an apparatus for producing reaction-product nuclei from reactant nuclei, the apparatus comprising: a plurality of reactant nuclei and a plurality of moderating nuclei wherein the moderating nuclei comprise nuclei of atoms that are chosen from a group consisting of deuterium, tritium, helium-4, lithium-7, beryllium, boron-11, carbon, nitrogen-15, oxygen, fluorine, neon-20 and neon-22 and a neutron source that is neither a nuclear reactor nor a subcritical assembly, in proximity to the reactant nuclei sufficient to produce reaction-product nuclei by neutron capture wherein the reactant nuclei comprise molybdenum-98 wherein the rate of molybdenum-98 nuclei neutron capture divided by the rate of the neutron source's neutron production is greater than approximately 1 percent wherein the mass of molybdenum-98 is less than approximately 1000 kg and wherein the mass of moderating nuclei is at least 1 kg. 2. the apparatus of claim 1, wherein the mass of molybdenum-98 is less than approximately 100 kg. 3. the apparatus of claim 1, wherein the mass of molybdenum-98 is less than approximately 25 kg. 4. the apparatus of claim 2, wherein the rate of reactant nuclei neutron capture divided by the rate of the neutron source's neutron production is greater than approximately 5 percent. 5. the apparatus of claim 1, further comprising the use of temperature control capable of maintaining at least 2 different regions of the apparatus at different temperatures wherein at least one region is cooled to a temperature below 250 degrees kelvin. 6. the apparatus of claim 5, wherein the temperature control comprises the use of a cryogenic fluid. 7. the apparatus of claim 1, further comprising at least one neutron reflector at least partially surrounding the pluralities of reactant nuclei and moderating nuclei, wherein the reflector comprises moderating nuclei and wherein the reflector thickness is greater than approximately 20 centimeters and less than approximately 15 meters. 8. the apparatus of claim 1, further comprising both an outer and an inner neutron reflector that reflect neutrons towards regions containing higher densities of reactant nuclei. 9. the apparatus of claim 1, wherein the pluralities are arranged in one or more approximately parallel layers, and wherein at least one layer is distinct from another layer on the basis of elemental composition, concentration of chemical species, density or temperature. 10. the system of claim 1, further comprising a target configured to emit neutrons when impacted by accelerated particles wherein the target is comprised of atoms chosen from a group consisting of deuterium, tritium, helium-4, lithium-7, beryllium, boron-11, carbon, nitrogen-15, oxygen, fluorine, neon-20, neon-22, tantalum, tungsten, lead, mercury, thallium, thorium, uranium, neptunium and other transuranics, wherein the accelerated particles enter the system via an access channel configured to accept greater than 50 percent of the accelerated particles that impinge upon the access channel. 11. a system for producing a decay product from a reactant using a neutron source, comprising: a plurality of reactant nuclei and a plurality of moderating nuclei wherein the moderating nuclei comprise nuclei of atoms that are chosen from a group consisting of deuterium, tritium, helium-4, lithium-7, beryllium, boron-11, carbon, nitrogen-15, oxygen, fluorine, neon-20 and neon-22 and a neutron source wherein the reactant nuclei comprise molybdenum-98 wherein the rate of molybdenum-98 nuclei neutron capture divided by the rate of the neutron source's neutron production is greater than approximately 1 percent wherein the mass of molybdenum-98 is less than approximately 100 kg and wherein the mass of moderating nuclei is at least 1 kg. 12. the system of claim 11, wherein the neutron source is a nuclear reactor or subcritical assembly. 13. the system of claim 11, wherein the neutrons are generated by a source that is neither a reactor nor a subcritical assembly. 14. the system of claim 11, further comprising a target configured to emit neutrons when impacted by accelerated particles wherein the target is comprised of atoms chosen from a group consisting of deuterium, tritium, helium-4, lithium-7, beryllium, boron-11, carbon, nitrogen-15, oxygen, fluorine, neon-20, neon-22, tantalum, tungsten, lead, mercury, thallium, thorium, uranium, neptunium and other transuranics, and wherein the accelerated particles enter the system via an access channel configured to accept greater than 50 percent of the accelerated particles that impinge upon the access channel. 15. the system of claim 11, further comprising at least one neutron reflector comprising moderating nuclei, wherein the neutron reflector at least partially surrounds the layers of the pluralities of reactant and moderating nuclei, and wherein the thickness of the neutron reflector is greater than approximately 20 centimeters and less than approximately 15 meters. 16. the system of claim 11, further comprising both an outer and an inner neutron reflector that reflect neutrons towards regions of the pluralities containing higher densities of reactant nuclei. 17. the system of claim 11, further comprising temperature control capable of maintaining at least 2 different regions of the apparatus at different temperatures, wherein at least one region is cooled to a temperature below 250 degrees kelvin. 18. the system of claim 17, wherein the temperature control comprises a cryogenic fluid. 19. a system for producing reaction-product nuclei, comprising reactant nuclei, a neutron source in proximity to the reactant nuclei sufficient to produce reaction-product nuclei by neutron capture and wherein at least 100 g of the system is cooled to a temperature at or below approximately 250 kelvin. 20. a system according to claim 19, wherein the reactant nuclei comprise molybdenum-98. 21. a system according to claim 20, wherein the rate of molybdenum-98 nuclei neutron capture divided by the rate of the neutron source's neutron production is greater than approximately 1 percent. 22. a system according to claim 21, further comprising moderating nuclei wherein the moderating nuclei comprise nuclei of atoms that are chosen from a group consisting of deuterium, tritium, helium-4, lithium-7, beryllium, boron-11, carbon, nitrogen-15, oxygen, fluorine, neon-20 and neon-22.

Results: 19

1) Family number: 49384010 (US2012321027A)

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Title: METHOD AND DEVICE FOR PRODUCING TWO DIFFERENT RADIOACTIVE ISOTOPES

Abstract: A method is provided for producing first and second radioactive isotopes using an accelerated particle beam that is directed to a first material and the first radioactive isotope is produced by a first nuclear reaction based on the interaction of the particle beam with the first material, said particle beam is also slowed down and subsequently directed to a second material, and the second radioactive isotope is produced by a second nuclear reaction based on the interaction of the particle beam with the second material. The effective cross-section for the induction of the first nuclear reaction at a first peak for a first particle energy is higher than an effective cross-section for the induction of the second nuclear reaction at a second peak for a second particle energy. A corresponding device includes an acceleration unit, a first exposure target having the first material and a second exposure target having the second material.

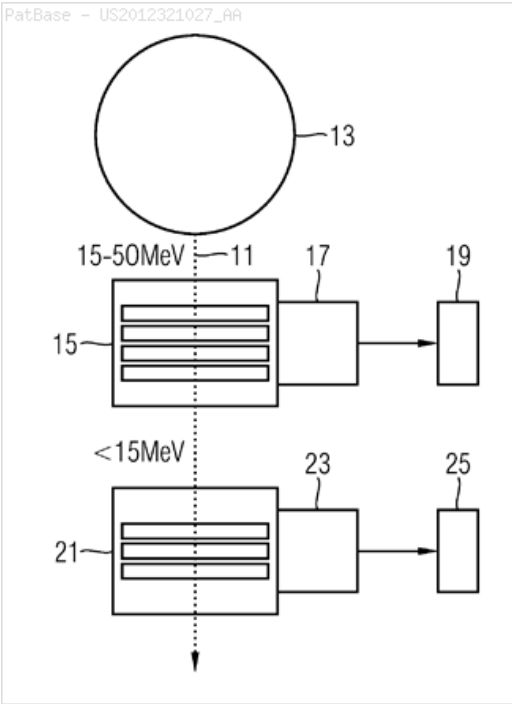
Classifications:

International (IPC 8-9): G21G1/00 G21G1/10 G21G4/08 G21H5/00 H05H6/00 (Advanced/Invention)

CPC: G21G2001/0015 G21G2001/0036 G21G2001/0042 G21G1/10 H05H6/00

European: G21G1/10 H05H6/00

US: 1/1 376/190 376/194



Family:

Publication number	Publication date	Application number	Application date
BR112012019102 A2	20160913	BR20121119102	20110126
CA2788617 AA	20110804	CA20112788617	20110126
CN102741940 A	20121017	CN201180007969	20110126
CN102741940 B	20160810	CN201180007969	20110126
DE102010006433 A1	20110804	DE201010006433	20100201
DE102010006433 B4	20120329	DE201010006433	20100201
EP2532008 A1	20121212	EP20110701810	20110126
JP2013518267 T2	20130520	JP20120550421T	20110126
RU2012137198 A	20140310	RU20120137198	20110126
RU2549881 C2	20150510	RU20120137198	20110126
US2012321027 AA	20121220	US20110576446	20110126
US9287015 BB	20160315	US20110576446	20110126
WO11092175 A1	20110804	WO2011EP51019	20110126

Priority:

DE201010006433 20100201 WO2011EP51019 20110126

Probable Assignee: SIEMENS AG

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Agent(s): SMART AND BIGGAR; SLAYDEN GRUBERT BEARD PLLC; SIEMENS AKTIENGESELLSCHAFT

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

2) Family number: 55365115 (US2013336437A)

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Title: APPARATUS AND METHODS FOR TRANSMUTATION OF ELEMENTS

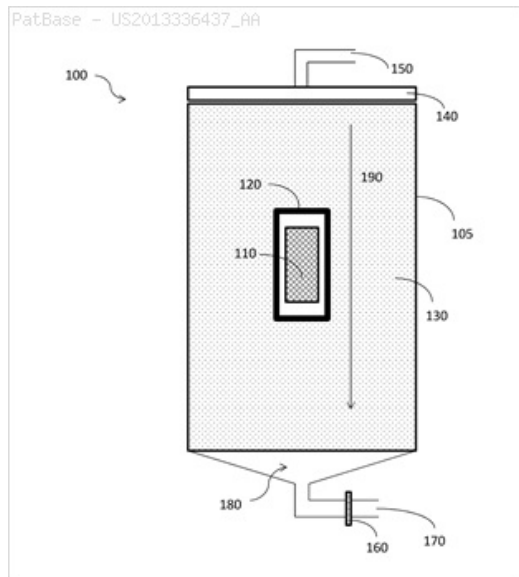
Abstract: Examples of apparatus and methods for transmutation of an element are disclosed. An apparatus can include a neutron emitter configured to emit neutrons with a neutron output, a neutron moderator configured to reduce the average energy of the neutron output to produce a moderated neutron output, a target configured to absorb neutrons when exposed to the moderated neutron output, the absorption of the neutrons by the target producing a transmuted element, and an extractor configured to extract the desired element. A method can include producing a neutron output, reducing the average energy of the neutron output with a neutron moderator to produce a moderated neutron output, absorbing neutrons from the moderated neutron output with the target to generate a transmuted element, and eluting a solution through the target to extract a desired element. In some examples, the target includes molybdenum-98, and the desired element includes technetium-99m.

Classifications:

International (IPC 8-9): G21G1/00 G21G1/06 G21G4/08 G21K1/00 G21K5/02 G21K5/08 (Advanced/Invention)

CPC: G21G1/06 G21G1/001 G21G2001/0042

US: 376/186 376/189



Family:

Publication number	Publication date	Application number	Application date
AU2013274040 AA	20131219	AU20130274040	20130614
AU2013274040 BB	20170112	AU20130274040	20130614
CA2876018 AA	20141205	CA20132876018	20130614
CN104488037 A	20150401	CN201380031629	20130614
CN104488037 B	20161221	CN201380031629	20130614
DE602013020041 D1	20170608	DE201360020041T	20130614
EP2862181 A2	20150422	EP20130750601	20130614
EP2862181 B1	20170419	EP20130750601	20130614
JP2015519586 T2	20150709	JP20150517456T	20130614
KR20150023005 A	20150304	KR20157000754	20130614
US2013336437 AA	20131219	US20130918196	20130614
US2017200521 AA	20170713	US20170417668	20170127
US9576690 BB	20170221	US20130918196	20130614
WO13188793 A2	20131219	WO2013US45935	20130614
WO13188793 A3	20140213	WO2013US45935	20130614

Priority:

US20120660463P	20120615	US20130824216P	20130516	EP20130750601	20130614
US20130918196	20130614	WO2013US45935	20130614	US20170417668	20170127

Probable Assignee: DENT INT RESEARCH INC

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Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

3) Family number: 61644152 (US2016042826A)

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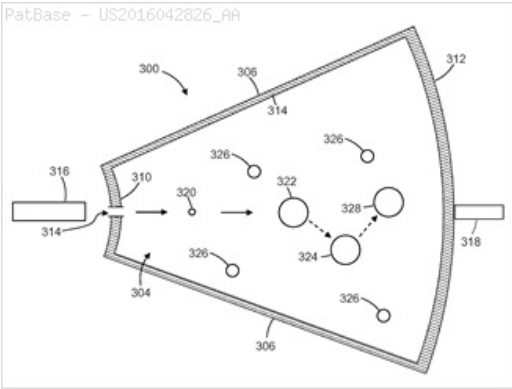
Title: HIGH EFFICIENCY NEUTRON CAPTURE PRODUCT PRODUCTION

Abstract: An apparatus for use with a neutron source for producing reaction-product nuclei from reactant nuclei includes a plurality of reactant nuclei and a plurality of moderating nuclei. The reactant nuclei and the moderating nuclei are configured to increase the probability of neutron capture by reactant nuclei to achieve enhanced ratios of neutron capture by reactant nuclei to neutron source neutron production. Moderating nuclei and neutron reflection are used to minimize neutron leakage. Temperature control, including cryogenic temperature control, may be used to enhance the rate or probability of reactant nuclei neutron capture. The reactant nuclei may include molybdenum-98 and reaction-product nuclei may include technetium-99m.

Classifications:

International (IPC 8-9): A61M39/00 A61M39/12 B29C65/00 B29C65/48 C08L23/10 G01N G01N23/222 G01V G01V5/00 G1N23/222 G1V5/00 G21G G21G1/00 G21G1/02 G21G1/04 G21G1/06 G21G4/08 G21K1/10 G21K5/08 (Advanced/Invention); B29K21/00 B29K23/00 G21G4/02 (Advanced/Non-invention); G01V5/00 (Core/Invention)

International (IPC 1-7): G01N23/222 G01V5/00
CPC: G21G1/06
US: 376/186



Family:

Publication number	Publication date	Application number	Application date
AP201709694 A0	20170131	AP20170009694	20150806
AU2015300961 AA	20170202	AU20150300961	20150806
AU2015300961 BB	20190103	AU20150300961	20150806
BR112017002339 A2	20171121	BR20171102339	20150806
CA2955548 AA	20170117	CA20152955548	20150806
CL2017000145 A1	20170707	CL20170000145	20170118
CN106662540 A	20170510	CN201580042217	20150806
CO20170001040 A2	20170630	CO20170001040	20170203
CR20170063 A	20170615	CR20170000063	20150709
DOP2017000033 A	20170615	DO20170000033	20170203
EA201790056 A1	20170630	EA20170090056	20150806
EP3177912 A1	20170614	EP20150830288	20150806
EP3177912 A4	20180627	EP20150830288	20150806
GE20186925 B	20181112	GE20150014394	20150806
HK1233705 A1	20180202	HK20170106740	20170705
ID201713110 A	20171208	ID2017P0000464	20150806
IL250323 A0	20170330	IL20150250323	20150806
IN201717007267 A	20170630	IN201717007267	20170301
JP2017526909 T2	20170914	JP20170503137T	20150806
KR20170041215 A	20170414	KR20177004498	20150806
MX2017000922 A1	20171113	MX20170000922	20150806
PE07292017 A1	20170704	PE20170000162	20150806
PH2017500222 A	20170710	PH20170500222	20170206
SG11201700420T A1	20170227	SG20171100420	20150806
US2016042826 AA	20160211	US20150819585	20150806
WO16022848 A1	20160211	WO2015US44085	20150806

Priority:

US20140033691P 20140806 WO2015US39641 20150709 US20150819585 20150806
WO2015US44085 20150806

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Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

4) Family number: 53977244 (US2013142296A) © PatBase

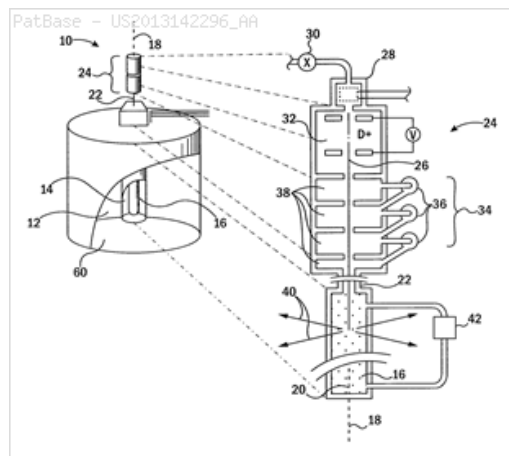
Title: APPARATUS AND METHOD FOR GENERATING MEDICAL ISOTOPES

Abstract: An apparatus for generating medical isotopes provides an annular fissile solution vessel surrounding a neutron generator. The annular fissile solution vessel provides for good capture of the emitted neutrons and a geometry that provides enhanced stability in an aqueous reactor. A neutron multiplier and/or a neutron moderator may be used to improve the efficiency and control the criticality of the reaction in the annular fissile solution vessel.
Classifications:
International (IPC 8-9): G21B1/00 G21C1/30 G21C3/04 G21G1/08
G21G1/10 G21K5/08 H05H3/06 H05H6/00 (Advanced/Invention);

G21C1/30 (Advanced/Non-invention)

CPC: H05H2277/116 G21G1/10 H05H6/00 G21G1/06 G21G1/08
G21G2001/0036 G21G2001/0042 G21G2001/0063 G21G2001/0068
G21K5/08 H05H3/06

US: 376/190 376/298 376/409



Family:

Publication number	Publication date	Application number	Application date
■ CN104321827 A	20150128	CN201280067363	20121121
■ CN104321827 B	20170222	CN201280067363	20121121
■ CN107086055 A	20170822	CN201710003742	20121121
■ IN04495DN2014 A	20150206	IN2014DN04495	20140603
■ JP2015510103 T2	20150402	JP20140545927T	20121121
■ JP6236012 B2	20171122	JP20140545927T	20121121
■ RU2014122587 A	20160127	RU20140122587	20121121
■ RU2625342 C2	20170713	RU20140122587	20121121
■ US2013142296 AA	20130606	US20110373899	20111205
■ WO13119299 A2	20130815	WO2012US66214	20121121
■ WO13119299 A3	20131031	WO2012US66214	20121121

Priority:

US20110373899 20111205 CN201280067363 20121121 WO2012US66214 20121121

Probable Assignee: SHINE MEDICAL TECHNOLOGIES INC

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Assignee(s): DEERFIELD MANAGEMENT CO LP ; WISCONSIN ALUMNI RESEARCH FOUNDATION ; SHINE MEDICAL TECHNOLOGIES INC ; WISCONSIN ALUMNI RESEARCH FOUNDATION

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Agent(s): TORINO SHOJI; WISCONSIN ALUMNI RESEARCH FOUNDATION

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

5) Family number: 43985338 (US2009279658A)

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Title: MOLTEN SALT NUCLEAR REACTOR

Abstract: A molten salt breeder reactor that has fuel conduit surrounded by a fertile blanket. The fuel salt conduit has an elongated core section that allows for the generation of electrical power on a scale comparable to commercially available nuclear reactors. The geometry of the fuel conduit is such that sub-critical conditions exist near the input and output of the fuel salt conduit and the fertile blanket surrounds the input and output of the fuel salt conduit, thereby minimizing neutron losses.

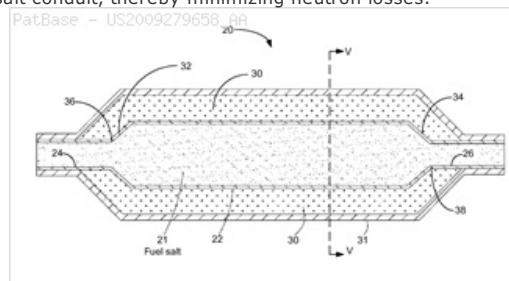
Classifications:

International (IPC 8-9): G21C1/22 G21G1/06 (Advanced/Invention);
G21C1/00 (Core/Invention)

CPC: G21C1/22 G21C3/22 G21C5/126 Y02E30/40

European: G21C1/22 G21C3/22 G21C5/12G Y02E30/40

US: 376/172 376/172P 376/360



Family:

Publication number	Publication date	Application number	Application date
■ US2009279658 AA	20091112	US20080118118	20080509
■ US2012183112 AA	20120719	US20110310075	20111202

Priority:

US20080118118 20080509 US20110310075 20111202

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Assignee(s): (std): LEBLANC DAVID ; OTTAWA VALLEY RES ASSOCIATES L ; OTTAWA VALLEY RES ASSOCIATES LTD

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Inventor(s): (std): LEBLANC DAVID

Agent(s): BORDEN LADNER GERVAIS LLP, ANNE KINSMAN; BORDEN LADNER GERVAIS LLP ANNE KINSMAN

6) Family number: 49386342 (US2011280356A)

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Title: TECHNIQUES FOR ON-DEMAND PRODUCTION OF MEDICAL ISOTOPES SUCH AS MO-99/TC-99M AND RADIOACTIVE IODINE ISOTOPES INCLUDING I-131

Abstract: A system for radioisotope production uses fast-neutron-caused fission of depleted or naturally occurring uranium targets in an irradiation chamber. Fast fission can be enhanced by having neutrons encountering the target undergo scattering or reflection to increase each neutron's probability of causing fission (m, f) reactions in U-238. The U-238 can be deployed as layers sandwiched between layers of neutron-reflecting material, or as rods surrounded by neutron-reflecting material.

Classifications:

International (IPC 8-9): G21G1/00 G21G1/06 G21G1/08 G21G4/02

G21G4/08 G21K1/00 G21K1/06 G21K5/08 (Advanced/Invention);

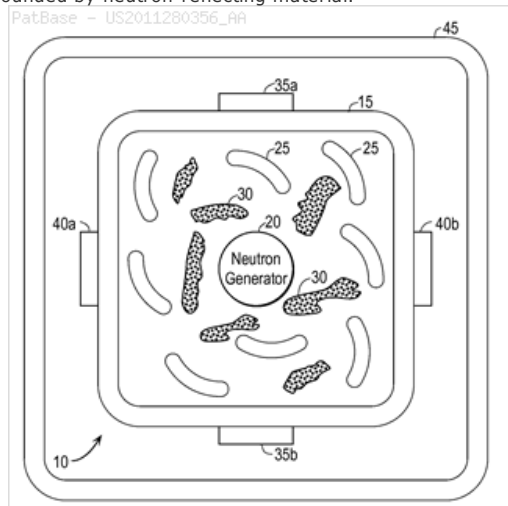
B01D59/26 G21G1/00 (Advanced/Non-invention)

CPC: G21G1/06 G21G2001/0036 G21G2001/0042 G21G2001/0063

G21G4/02 G21G1/08 G21G1/001

European: G21G1/08 S21G1/00R15 S21G1/00R16 S21G1/00R20

US: 1/1 376/156 376/158 376/158S 376/159 376/168 376/169 376/170 376/170P 376/189 376/189P 376/189S 376/202 376/202S



Family:

Publication number	Publication date	Application number	Application date
CA2784064 AA	20120612	CA20102784064	20101112
CA2784064 C	20161206	CA20102784064	20101112
CA2933961 AA	20110804	CA20102933961	20101112
CA2933961 C	20170829	CA20102933961	20101112
CA2973967 AA	20110804	CA20102973967	20101112
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CN107068229 A	20170818	CN201610816651	20101112
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US2011280356 AA	20111117	US20100944634	20101111
US2011286565 AA	20111124	US20100944694	20101111
US2015243395 AA	20150827	US20150709408	20150511
US2015243396 AA	20150827	US20150627977	20150220
US2017032860 AA	20170202	US20160263075	20160912
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Priority:

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WO2010US56573 20101112	US20150627977 20150220	US20150709408 20150511
JP20160113143 20160607	CA20162784064 20160630	US20160263075 20160912
US20170436432 20170217	CA20172933961 20170725	

Probable Assignee: GLOBAL MEDICAL ISOTOPE SYSTEMS LLC

Assignee(s): (std): GLOBAL MEDICAL ISOTOPE SYSTEMS LLC ; MIPOD NUCLEAR INC ; TSANG FRANCIS YU HEI ; TSANG FRANCIS Y

Assignee(s): TSANG FRANCIS Y4175 DEMOLINE CIRCLELAS VEGASNV89141US ; MIPOD NUCLEAR INC605 - 3540 W. SAHARA AVENUELAS VEGASNV89102US ; GLOBAL MEDICAL ISOTOPE SYSTEMS LLC100 - 1850 WHITNEY MESA DRIVEHENDERSONNV89014US

Inventor(s): (std): TSANG FRANCIS YU HEI ; TSANG FRANCIS Y ; FRANCIS YU HEI TSANG

Inventor(s): TSANG FRANCIS YU HEIUS

Agent(s): SMART AND BIGGAR; GOWLING LAFLEUR HENDERSON LLP; GOWLING WLG CANADA LLP; SKONE JAMES ROBERT EDMUND; CONNIE R; KNOBBE MARTENS OLSON AND BEAR LLP; SLONE DAVID N ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

7) Family number: 44090398 (US2011118491A)

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Title: PROCESS FOR THE PRODUCTION OF NO-CARRIER ADDED 99 MO

Abstract: The present invention relates to a process for the production of no-carrier added 99Mo by neutron activation of 98Mo thereby reaching specific radioactivity which allow the use of such produced 99Mo as an option for the 99Mo produced by the fission of 235U. This has been achieved by taking advantage of the recoil of the 99Mo nuclei upon the capture of neutrons by the 98Mo containing compound. These recoiled nuclei are no longer chemically bound to the 98Mo containing compound allowing further specific separation. Preferred 98Mo containing compounds are molybdenum(O)hexacarbonyl [(Mo(CO)6] and molybdenum (VI) di oxodioxinate [C4H3(O) -NC5H3] J2-MoO2.

Classifications:

International (IPC 8-9): C07F11/00 G21G G21G1/06 (Advanced/Invention); G21G1/00 (Core/Invention); G21G (Subclass/Invention)

CPC: G21G1/06 G21G2001/0036

European: G21G1/06 S21G1/00R15

US: 556/58 556/58S 556/59 556/59P

Family:

Publication number	Publication date	Application number	Application date
 AU2009255830 AA	20091210	AU20090255830	20090602
 BRPI0914861 A2	20151103	BR2009PI14861	20090602
 CA2727156 AA	20091210	CA20092727156	20090602
 CN102113059 A	20110629	CN200980130386	20090602
 EP2131369 A1	20091209	EP20080157758	20080606
 EP2301041 A1	20110330	EP20090758553	20090602
 JP2011522276 T2	20110728	JP20110512400T	20090602
 RU2010154094 A	20120720	RU20100154094	20090602
 US2011118491 AA	20110519	US20090996209	20090602
 WO09148306 A1	20091210	WO2009NL50301	20090602
 ZA201009139 A	20120725	ZA20100009139	20101220

Priority:

EP20080157758 20080606 EP20090758553 20090602 WO2009NL50301 20090602

Probable Assignee: MO989 HOLDING BV

Assignee(s): (std): BODE PETER ; MO989 HOLDING BV ; UNIV DELFT TECH ; WOLTERBEEK HUBERT THEODOOR ; WOLTERBEEK HUBERT THEODOR

Assignee(s): TECHNISCHE UNIVERSITEIT DELF ; TECHNISCHE UNIVERSITEIT DELFT

Inventor(s): (std): THEODOOR WOLTERBEEK HUBERT ; PETER BODE ; WOLTERBEEK HUBERT THEODOR ; BODE PETER ; WOLTERBEEK HUBERT THEODOOR

Inventor(s): HUBERT THEODOOR WOLTERBEEK

Agent(s): SHELSTON IP; SHELSTON IP PTY LTD; BERESKIN AND PARR LLP SENCRL SRL; KUPECZ ARPAD; JANSEN CORNELIS MARINUS; PATENT BODY CORPORATE TAKEWA INT PATENT OFFICE

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

8) Family number: 48475403 (WO12095644A1)

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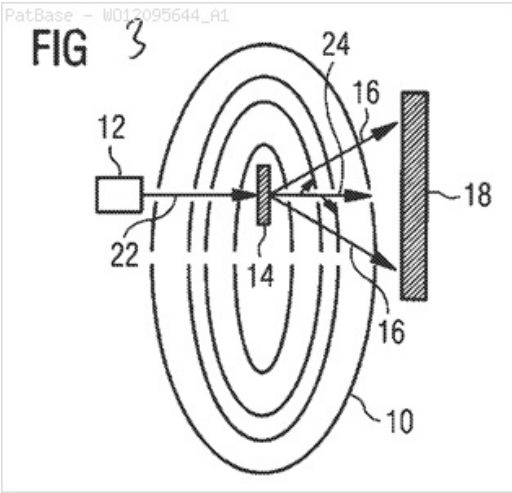
Title: A COMPACT, LOW ENERGY NEUTRON SOURCE

Abstract: A neutron source comprising an electrostatic particle accelerator (10; 30) and a neutron-emitting target material (14; 40) arranged such that charged particles (22; 36) may be accelerated by the electrostatic particle accelerator to hit the neutron-emitting target material, releasing neutrons (16; 10 42). The electrostatic particle accelerator comprises concentric shells (102) each divided into two parts at an equatorial plane (103), and further comprises diodes connected to shell parts across the equatorial plane.

Classifications:

International (IPC 8-9): A61K41/00 G21G1/06 G21G1/10 G21K5/00 H05H3/06 H05H5/00 H05H5/04 H05H5/06 (Advanced/Invention)

CPC: G21G1/06 G21G2001/0036 G21K5/00 H05H3/06 H05H5/063
H05H5/066 G21G1/10 H05H5/045 A61K41/0095 H05H5/00
European: G21G1/06 H05H3/06 H05H5/04B H05H5/06A H05H5/06B
S21G1/00R15 S21K5/00



Family:

Publication number	Publication date	Application number	Application date
GB201100442 A0	20110223	GB20110000442	20110112
GB201104717 A0	20110504	GB20110004717	20110321
GB201109558 A0	20110720	GB20110009558	20110608
GB2487198 A1	20120718	GB20110000442	20110112
GB2489400 A1	20121003	GB20110004717	20110321
GB2491610 A1	20121212	GB20110009558	20110608
WO12095644 A1	20120719	WO2012GB50008	20120105

Priority:

GB20110000442 20110112 GB20110004717 20110321 GB20110009558 20110608

Probable Assignee: SIEMENS AG

Assignee(s): (std): BEASLEY PAUL ; HEID OLIVER ; HUGHES TIMOTHY ; SIEMENS AG

Assignee(s): SIEMENS AKTIENGESELLSCHAFT

Inventor(s): (std): HEID OLIVER ; HUGHES TIMOTHY JOHN ; BEASLEY PAUL ; HUGHES TIMOTHY

Inventor(s): OLIVER HEID ; TIMOTHY JOHN HUGHES ; PAUL BEASLEY

Agent(s): FRENCH CLIVE HARRY ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT QA RO RS RU RW SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

9) Family number: 29544430 (WO03092340A1) © PatBase

Title: PARTICLE ACCELERATOR

Abstract: The invention concerns a particle accelerator, comprising a source for generating a beam of charged particles to be accelerated, at least one cyclotron for accelerating particles derived from the source, at least one actuator (40) for acting on the beam particles before they are accelerated by the cyclotron, at least one sensor (33) for delivering an information representing the intensity of the beam of particles accelerated by the cyclotron, and a programmable control device (50) for acting on the actuator on the basis of information delivered by the sensor and a programmed control law of the intensity of the beam of particles accelerated in time, so that the intensity of the beam delivered by the cyclotron observes the programmed control law.

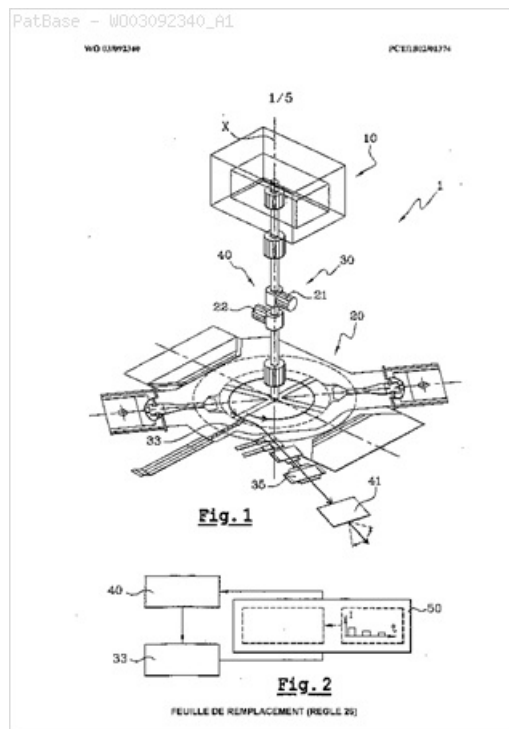
Classifications:

International (IPC 8-9): H05H1/00 H05H13/00 (Advanced/Invention);
H05H1/00 H05H13/00 (Core/Invention)

International (IPC 1-7): H05H1/00 H05H13/00

CPC: H05H13/00 Y02E30/37

European: H05H13/00 Y02E30/37

**Family:**

Publication number	Publication date	Application number	Application date
AU2002258016 AA	20031110	AU20020258016	20020425
CA2495460 AA	20050131	CA20022495460	20020425
CN1631061 A	20050622	CN20028029222	20020425
EP1500313 A1	20050126	EP20020727821	20020425
RU2004134349 A	20050627	RU20040134349	20020425
RU2297735 C2	20070420	RU20040134349	20020425
W003092340 A1	20031106	W02002IB01374	20020425

Priority:

RU20040134349 20020425 WO2002IB01374 20020425

Probable Assignee: ACCELERATORS FOR IND AND MEDICAL

Assignee(s): (std): ACCELERATORS FOR IND AND MEDIC ; ACCELERATORS FOR IND AND MEDICAL ; MANDRILLON PIERRE ; EHKSELEREJTERS FOR INDASTRIAL

Assignee(s): EHKSELEREJTERS FOR INDASTRIAL EHND MEDIKAL APLIKEJ ; EHKSELEREJTERS FOR INDASTRIAL EHND MEDIKAL APLIKEJSHNS INZHINIRING PROMOUSHEN SESAJETI AJMA EPS ; ACCELERATORS FOR INDUSTRIAL AND MEDICAL APPLICATIO ; ACCELERATORS FOR INDUSTRIAL AND MEDICAL APPLICATIONS ENGINEERING PROMOTIO ; ACCELERATORS FOR INDUSTRIAL AND MEDICAL APPLICATIONS ENGINEERING PROMOTIO N SOCIETYAIMAEPS ; ACCELERATORS FOR INDUSTRIAL AND MEDICAL APPLICATIONS ENGINEERING PROMOTION SOCIETY AIMA EPS

Inventor(s): (std): MANDRIJON P ER ; MANDRILLON PIERRE ; PIERRE MANDRILLON

Inventor(s): MANDRIJON P'ER

Agent(s): ROBIC

Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE ES FI FR GA GB GD GE GH GM GN GQ GR GW HR HU ID IE IL IN IS IT JP KE KG KP KR KZ LC LI LK LR LS LT LU LV MA MC MD MG MK ML MN MR MW MX MZ NE NL NO NZ OM PH PL PT RO RU SD SE SG SI SK SL SN SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VN YU ZA ZM ZW

10) Family number: 23577462 (JP2002214395A)

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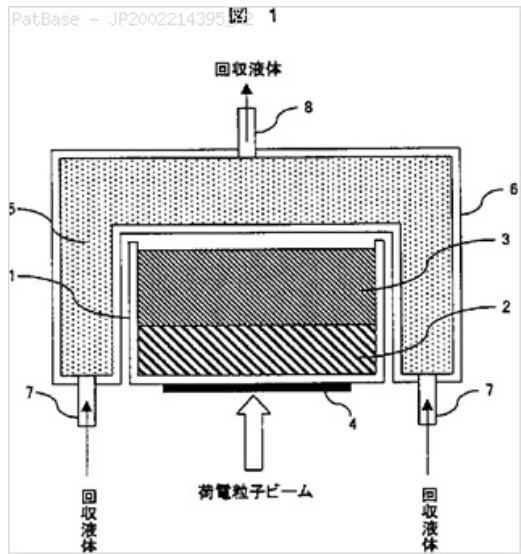
Title: ISOTOPIC NUCLIDE MANUFACTURING DEVICE

Abstract: PROBLEM TO BE SOLVED: To provide an isotopic nuclide manufacturing device allowing improvement of production efficiency of isotopic nuclide produced using neutrons.SOLUTION: Neutrons are multiplied by a neutron multiplication material 2, and then moderated by a neutron moderator 3. The neutrons moderated by the neutron moderator 3 are made incident on an isotopic nuclide producing material 5, thereby generating isotopic nuclide with nuclear reaction. The neutrons causing the nuclear reaction in the isotopic nuclide producing material 5 increase by multiplying and moderating the neutrons, so that the production efficiency of the isotopic nuclide is improved.

Classifications:

International (IPC 8-9): G21G1/06 G21G4/08 (Advanced/Invention); G21G1/00 G21G4/00 (Core/Invention)

International (IPC 1-7): G21G1/06 G21G4/08



Family:

Publication number	Publication date	Application number	Application date
JP2002214395 A2	20020731	JP20010004372	20010112

Priority:

JP20010004372 20010112

Probable Assignee: HITACHI LTD

Assignee(s): (std): HITACHI LTD

Inventor(s): (std): TAKEUCHI KAZUHIRO ; OKAZAKI TAKASHI ; MORI TOSHIKATSU ; MAKI KOICHI

11) Family number: 48693534 (US2011079108A)

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Title: METHOD AND APPARATUS FOR ISOLATING THE RADIOISOTOPE MOLYBDENUM-99

Abstract: A method of isolating ⁹⁹Mo produced using a (n,gamma) reaction according to example embodiments may include vaporizing a source compound containing ⁹⁸Mo and ⁹⁹Mo. The vaporized source compound may be ionized to form ions containing ⁹⁸Mo and ⁹⁹Mo. The ions may be separated to isolate the ions containing ⁹⁹Mo. The isolated ions containing ⁹⁹Mo may be collected with a collector. Accordingly, the isolated ⁹⁹Mo may have a relatively high specific radioactivity and, in turn, may be used to produce the diagnostic radioisotope, ^{99m}Tc, through radioactive decay.

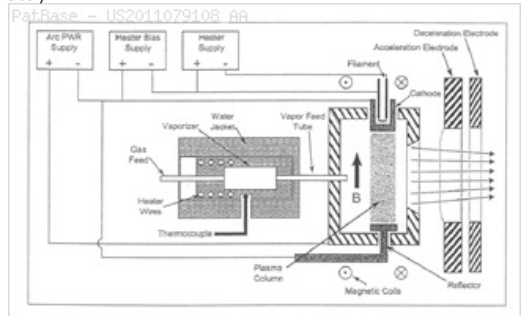
Classifications:

International (IPC 8-9): B01J19/08 C22B34/34 C22B4/00 C22B7/00 G21G1/00 (Advanced/Invention)

CPC: B01J19/081 G21G1/001 G21G2001/0036 C22B34/34 C22B7/002 Y02P10/212

European: C22B34/34 M22B7/00B2

US: 75/10.67 75/10.670P



Family:

Publication number	Publication date	Application number	Application date
US2011079108 AA	20110407	US20090588030	20091001
US9587292 BB	20170307	US20090588030	20091001

Priority:

US20090588030 20091001

Probable Assignee: ADVANCED APPLIED PHYSICS SOLUTIONS INC

Assignee(s): (std): ADVANCED APPLIED PHYSICS SOLUTIONS INC ; BECKER DIRK W ; D'AURIA JOHN M ; LAPI SUZANNE ; RUTH THOMAS J

Inventor(s): (std): BECKER DIRK W ; RUTH THOMAS J ; LAPI SUZANNE ; D'AURIA JOHN M

Inventor(s): D'AURIA JOHN M

Agent(s): HARNESS DICKEY AND PIERCE PLC

12) Family number: 71680553 (WO18197451A1)

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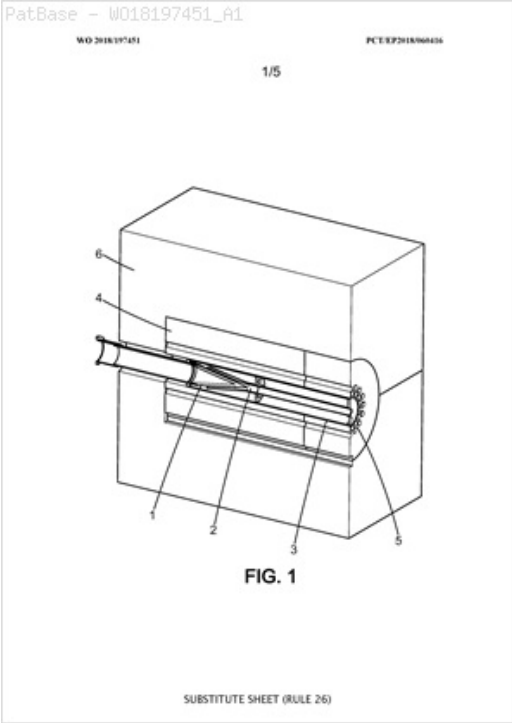
Title: ACCELERATOR-DRIVEN NEUTRON ACTIVATOR FOR BRACHYTHERAPY

Abstract: A neutron activator for neutron activation of a material, the neutron activator being configured to produce neutrons from an interaction with a proton beam (7), the neutron activator comprising: - a neutron source comprising a metallic target (1), and - a Beryllium first reflector-moderator (4) peripheral to the neutron source and comprising a neutron activation area (10) configured to accommodate the neutron source and the material to be activated, the neutron activation area (10) of the first reflector-moderator (4) comprising a bore configured to accommodate the neutron source.

Classifications:

International (IPC 8-9): A61K41/00 A61K51/00 A61K51/12 A61N5/10 G21G1/06 (Advanced/Invention)

CPC: A61N5/1001 G21G1/06



Family:

Publication number	Publication date	Application number	Application date
WO18197451 A1	20181101	WO2018EP60416	20180424

Priority:

EP20170305461 20170424

Probable Assignee: ADVANCED ACCELERATOR APPLICATIONS

Assignee(s): (std): ADVANCED ACCELERATOR APPLICATIONS

Inventor(s): (std): BUONO STEFANO ; MACIOCCO LUCA

Agent(s): CABINET PLASSERAUD

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DJ DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JO JP KE KG KH KM KN KP KR KW KZ LA LC LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

13) Family number: 41817581 (US2009274258A)

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Title: COMPOUND ISOTOPE TARGET ASSEMBLY FOR PRODUCTION OF MEDICAL AND COMMERCIAL ISOTOPES BY MEANS OF SPECTRUM SHAPING ALLOYS

Abstract: A neutron generator and method of using the same to produce commercial and medical isotopes. Isotopes are transmuted using fission spectrum neutrons produced in neutron multiplier alloys proximate a target isotope. The produced neutron fission spectrum is tailored or shaped by alloys disposed between the multiplier alloys and the target isotope. The tailoring alloys selectively convert the neutron fission spectrum to a nearly coherent distribution of selected high energy, fast, epithermal, or thermal neutrons. The tailoring alloys are engineered to slow the fission spectrum neutrons to the resonance energies of the selected target isotopes through scattering or hydriding of selected components of high temperature aluminum alloys that optimize neutron capture in engineered target alloys.

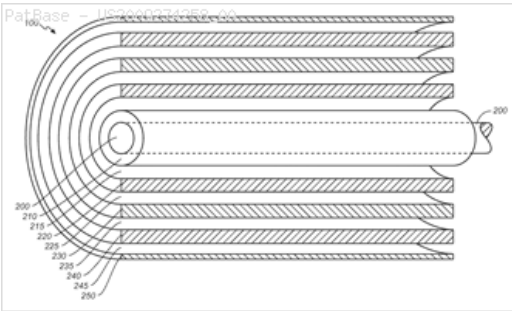
Classifications:

International (IPC 8-9): A61B5/00 G21B1/00 G21G1/00 G21G1/12 G21G4/00 G21G4/02 G21G4/04 (Advanced/Invention); A61B5/00 G21G1/00 G21G4/00 (Core/Invention)

CPC: G21G1/10 H05H3/06 H05H6/00

European: G21G1/10 H05H3/06 H05H6/00

US: 376/108 376/108P 376/112 376/156 376/190



Family:

Publication number	Publication date	Application number	Application date
US2009274258 AA	20091105	US20070296725	20070413
US2011268237 AA	20111103	US20070296844	20070413
US8625731 BB	20140107	US20070296844	20070413
WO08060663 A2	20080522	WO2007US66668	20070413
WO08060663 A3	20081204	WO2007US66668	20070413
WO08063693 A2	20080529	WO2007US66666	20070413
WO08063693 A3	20081023	WO2007US66666	20070413

Priority:

US20060792065P 20060414 US20060792066P 20060414 US20060792067P 20060414
US20060805541P 20060622 US20070296725 20070413 US20070296844 20070413
WO2007US66666 20070413 WO2007US66668 20070413

Probable Assignee: THORENCO LLC**Assignee(s):** (std): HOLDEN CHARLES S ; SCHENTER ROBERT E ; THORENCO LLC**Inventor(s):** (std): HOLDEN CHARLES S ; SCHENTER ROBERT E**Agent(s):** STAINBROOK AND STAINBROOK LLP; CRAIG M; STAINBROOK CRAIG M**Designated states:** AE AG AL AM AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW**14) Family number: 43948610 (US2011096887A)**

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Title: DEVICE AND METHOD FOR PRODUCING MEDICAL ISOTOPES

Abstract: A hybrid nuclear reactor that is operable to produce a medical isotope includes an ion source operable to produce an ion beam from a gas, a target chamber including a target that interacts with the ion beam to produce neutrons, and an activation cell positioned proximate the target chamber and including a parent material that interacts with the neutrons to produce the medical isotope via a fission reaction. An attenuator is positioned proximate the activation cell and selected to maintain the fission reaction at a subcritical level, a reflector is positioned proximate the target chamber and selected to reflect neutrons toward the activation cell, and a moderator substantially surrounds the activation cell, the attenuator, and the reflector.

Classifications:

International (IPC 8-9): G21B G21B1/01 G21C G21C1/02 G21C1/30 G21G G21G1/00 G21G1/02 G21G1/06 G21G1/08 G21G1/10 G21G4/08 G21K1/00 G21K5/02 G21K5/04 G21K5/08 H05H3/06

H05H6/00 (Advanced/Invention);

G21B1/00 G21B3/00 (Advanced/Non-invention);

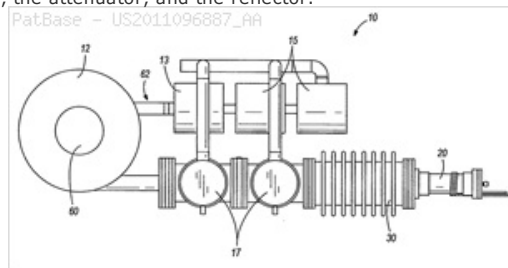
G21C1/00 G21G1/00 (Core/Invention);

G21C G21G (Subclass/Invention)

CPC: G21G1/02 G21C1/30 G21G1/00 G21G1/08 G21B1/01 G21C1/303 Y02E30/10 Y02E30/40

European: G21B1/01 G21C1/30B G21G1/08 Y02E30/10 Y02E30/40

US: 376/193 376/193P

**Family:**

Publication number	Publication date	Application number	Application date
CA2723224 AA	20091105	CA20092723224	20090501
CA2723224 C	20180925	CA20092723224	20090501
CN102084434 A	20110601	CN200980123452	20090501
CN102084434 B	20160120	CN200980123452	20090501
CN105575445 A	20160511	CN201510976878	20090501
CN105575445 B	20180724	CN201510976878	20090501
EP2294582 A2	20110316	EP20090739965	20090501
EP2294582 B1	20180815	EP20090739965	20090501
ES2695925 T3	20190111	ES20090739965T	20090501
HK1158811 A1	20160826	HK20110113063	20111201
HK1158811 A1	20120720	HK20110113063	20111201
HK1158811 A3	20120720	HK20110113063	20111201
HK1158811 B	20160826	HK20110113063	20111201
HK1224802 A1	20170825	HK20160113017	20161111
JP2011522226 T2	20110728	JP20110507694T	20090501
JP2014044214 A2	20140313	JP20130249823	20131203
JP2017053872 A2	20170316	JP20160249660	20161222
JP5793418 B2	20151014	JP20110507694T	20090501
JP6130289 B2	20170517	JP20130249823	20131203
KR101673954 B1	20161108	KR20107027045	20090501
KR20110031278 A	20110325	KR20107027045	20090501
KR20160072846 A	20160623	KR20167015856	20090501
PL2294582 T3	20190228	PL20090739965T	20090501
RU2010148920 A	20120610	RU20100148920	20090501
RU2494484 C2	20130927	RU20100148920	20090501
TR201817118 T4	20181221	TR20180017118T	20090501

US2011096887 AA	20110428	US20090990758	20090501
US2018166179 AA	20180614	US20170644497	20170707
US9734926 BB	20170815	US20090990758	20090501
WO09135163 A2	20091105	WO2009US42587	20090501
WO09135163 A3	20100225	WO2009US42587	20090501

Priority:

US20080050096P	20080502	US20080050096	20080502	CN200980123452	20090501
EP20090739965	20090501	JP20110507694	20090501	JP20110507694T	20090501
JP20130249823	20090501	WO2009US42587	20090501	US20090990758	20090501
US20110990758	20110112	JP20160249660	20161222	US20170644497	20170707

Probable Assignee: SHINE MEDICAL TECHNOLOGIES INC

Assignee(s): (std): PHOENIX NUCLEAR LABS LLC ; PIEFER GREGORY ; SHAJN MEDIKAL TEKNOLODZHIS INK ; SHINE MEDICAL TECH INC ; SHINE MEDICAL TECHNOLOGIES INC

Assignee(s): DEERFIELD MANAGEMENT CO LP

Inventor(s): (std): PIEFER GREGORY ; GREGORY PIEFER ; PIFER GREGORI ; PIEFER GREGORY G

Agent(s): TORYS LLP; GRUENECKER KINKELDEY STOCKMAIR AND SCHWANHAEUSSER ANWALTSSOZIETAET; GRUENECKER PATENT U RECHTSANWAELTE PARTG MBB; MILTENYI PETER; CLT PATENT AND TRADEMARK HK LTD; HONG KONG TRADEMARK AND DESIGN PROTECTION AGENCY LTD; BELGIN SAGDIC; MICHAEL BEST AND FRIEDRICH LLP; OTTERLEE THOMAS J

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

15) Family number: 15581626 (JP2001083297A)

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Title: RADIOACTIVE NUCLIDE GENERATOR FOR POSITRON EMISSION TOMOGRAPHY

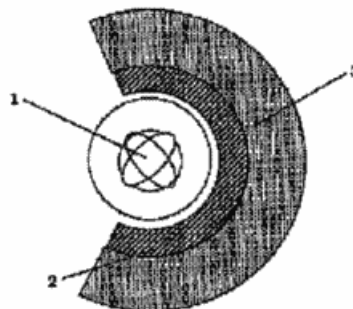
Abstract: PROBLEM TO BE SOLVED: To improve the efficiency in the utilization of neutrons in a region where radioactive nuclides are generated by locating a material, such as graphite, whose action for reflecting neutrons is strong behind the region where radioactive nuclides are generated. SOLUTION: A reflector 3 made of graphite is located behind a region 2, composed of a lithium hydroxide solution, where radioactive nuclides are generated. Then, neutrons generated from a neutron source 1 reach the region 2 and react with 6Li to generate 3t . The 3t reacts like 16O and $16\text{O}(\text{t}, \text{m})18\text{F}$ to generate radioactive nuclides 18F for positron emission tomography(PET). On this occasion, the neutrons reflected by the graphite generate 3t again similarly and it reacts like 16O and $16\text{O}(\text{t}, \text{m})18\text{F}$ to generate radioactive nuclides 18F for PET similarly, so that substances can be used effectively. In other words, the provision of the reflector 3 makes it possible to obtain a neutron utilization rate of 60 percent or higher even if the thickness of the region 2 is 3 cm.

Classifications:

International (IPC 8-9): G21G4/00 G21G4/08 (Advanced/Invention); G21G4/00 (Core/Invention)

International (IPC 1-7): G21G4/00

PatBase - JP2001083297_R2



Family:

Publication number	Publication date	Application number	Application date
JP2001083297 A2	20010330	JP19990263229	19990917

Priority:

JP19990263229 19990917

Probable Assignee: HITACHI LTD

Assignee(s): (std): HITACHI LTD

Inventor(s): (std): HONDA TAKURO ; MAKI KOICHI ; OKAZAKI TAKASHI ; TAKEUCHI KAZUHIRO

Title: NEUTRON-DRIVEN ELEMENT TRANSMUTER

Abstract: A material is exposed to a neutron flux by distributing it in a neutron-diffusing medium surrounding a neutron source. The diffusing medium is transparent to neutrons and so arranged that neutron scattering substantially enhances the neutron flux to which the material is exposed. Such enhanced neutron exposure may be used to produce useful radioisotopes, in particular for medical applications, from the transmutation of readily-available isotopes included in the exposed material. It may also be used to efficiently transmute long-lived radioactive wastes, such as those recovered from spent nuclear fuel. The use of heavy elements, such as lead and/or bismuth, as the diffusing medium is particularly of interest, since it results in a slowly decreasing scan through the neutron energy spectrum, thereby permitting very efficient resonant neutron capture in the exposed material.

Classifications:**International (IPC 8-9):** G01V5/00 G01V5/04 G21C1/00 G21C1/22 G21C1/30 G21G1/00 G21G1/02 G21G1/06

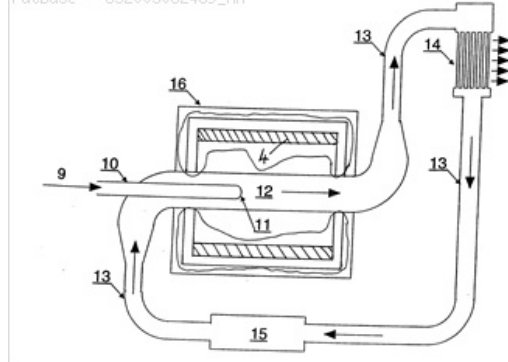
G21G1/10 (Advanced/Invention);

G21G1/00 (Core/Invention);

G21G (Subclass/Invention)

International (IPC 1-7): G01V5/00 G01V5/04 G21G1/00 G21G1/06**CPC:** G21G1/06**European:** G21G1/06**US:** 250/262 250/262S 376/156 376/158 376/158P 376/187 376/189 376/201 376/359 376/360

PatBase - US2005082469_AA

**Family:**

Publication number	Publication date	Application number	Application date
AT326757 E	20060615	AT19970930374T	19970619
AU199734352 A1	19990104	AU19970034352	19970619
BG103954 A	20010131	BG19990103954	19991206
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CA2294063 AA	19991214	CA19972294063	19970619
CA2294063 C	20070327	CA19972294063	19970619
CZ298765 B6	20080123	CZ19990004520	19970619
CZ9904520 A3	20000614	CZ19990004520	19970619
DE69735898 D1	20060622	DE19976035898	19970619
DE69735898 T2	20070419	DE19976035898T	19970619
EP0990238 A1	20000405	EP19970930374	19970619
EP0990238 B1	20060517	EP19970930374	19970619
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JP2002504231 T2	20020205	JP19990503620T	19970619
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NO326221 B1	20081020	NO19990006312	19991217
NO996312 A	20000208	NO19990006312	19991217
NO996312 A0	19991217	NO19990006312	19991217
PL185508 B1	20030530	PL19970337441	19970619
PL337441 A1	20000814	PL19970337441	19970619
PT990238 T	20061031	PT19970930374T	19970619
SK166999 A3	20000711	SK19990001669	19970619
SK286044 B6	20080107	SK19990001669	19970619
US2005082469 AA	20050421	US20040985323	20041109
US7796720 BA	20100914	US19970446144	19970619
US8090072 BB	20120103	US20040985323	20041109
WO9859347 A1	19981230	WO1997EP03218	19970619

Priority:CZ19990004520 19970619 WO1997EP03218 19970619 US20000446144 20000302
US20040985323 20041109**Probable Assignee:** EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH**Assignee(s):** (std): EUROP ORG FOR NUCLEAR RESEARCH ; RUBBIA CARLO**Assignee(s):** EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH ; EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH GENF ; EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH GENF GENEVE**Inventor(s):** (std): CARLO RUBBIA ; RUBBIA CARLO**Agent(s):** GOUDREAU GAGE DUBUC ; LAVERY DE BILLY LLP; MICHAEL L KENAGA PIPER RUDNICK LLP; PATZIK FRANK AND SAMOTNY LTD**Designated states:** AL AM AT AU AZ BA BB BE BF BG BJ BR BY CA CF CG CH CI CM CN CU CZ DE DK EE ES FI FR GA GB GE GH GN GR HU IE IL IS IT JP KE KG KP KR KZ LC LI LK LR LS LT LU LV MC MD MG MK ML MN MR MW MX NE NL NO NZ PL PT RO RU SD SE SG SI SK SL SN SZ TD TG TJ TM TR TT UA UG US UZ VN YU ZW

Title: NEUTRON BEAM FORMING USING MOMENTUM TRANSFER

Abstract: Apparatus and methods for forming thermal, epithermal, and/or cold neutrons into a beam using momentum transfer. The apparatus includes a source of thermal, epithermal, or cold neutrons, a momentum transfer mechanism containing a collection of suitable atoms that collide elastically with the neutrons, and an apparatus for moving the momentum transfer medium in a preferred direction. The embodiments include locating the neutron source within the test section of a wind tunnel filled with a gas consisting of appropriate atoms, either supersonic, transonic, or subsonic, locating the neutron source in the midst of multiple rotors constructed of appropriate atoms, and locating the neutron source inside a tube constructed of appropriate atoms, where the tube is excited by a mechanical transducer to a bulk acoustic wave, while the neutron source is optionally switched off and on to cause neutrons to enter the tube walls only when the tube walls are moving in the preferred direction.

Classifications:

International (IPC 8-9): G01N23/20 G01V5/00

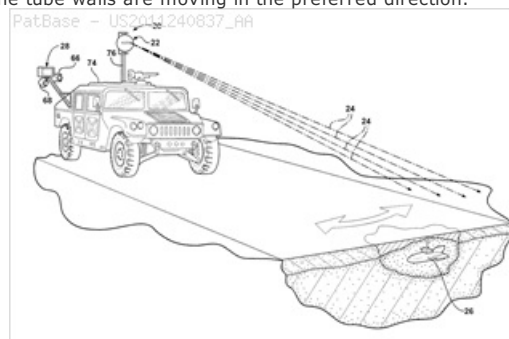
H05H3/02 (Advanced/Invention);

G01N23/20 G01V5/00 (Core/Invention)

CPC: H05H3/06

European: H05H3/06

US: 250/251 250/251P



Family:

Publication number	Publication date	Application number	Application date
US2011240837 AA	20111006	US20090130778	20091124
WO10060075 A2	20100527	WO2009US65680	20091124
WO10060075 A3	20100819	WO2009US65680	20091124

Priority:

US20080117295P 20081124 US20090130778 20091124 WO2009US65680 20091124

Probable Assignee: BOSS PHYSICAL SCIENCES LLC

Assignee(s): (std): BOSS PHYSICAL SCIENCES LLC ; BOSSDEV INC ; NORRIS WAYNE B

Inventor(s): (std): NORRIS WAYNE B

Agent(s): HIDLAY KIMBERLY M ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: HIGH ENERGY PROTON OR NEUTRON SOURCE

Abstract: The invention provides a compact high energy proton source useful for medical isotope production and for other applications including transmutation of nuclear waste. The invention further provides a device that can be used to generate high fluxes of isotropic neutrons by changing fuel types. The invention further provides an apparatus for the generation of isotopes including but not limited to 18F, 11C, 15O, 63Zn, 124I, 133Xe, 111In, 125I, 131I, 99Mo, and 13N.

Classifications:

International (IPC 8-9): A61N5/10 G01T1/161 G21G1/00 G21G1/10

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H05H6/00 H05H9/00 (Advanced/Invention);

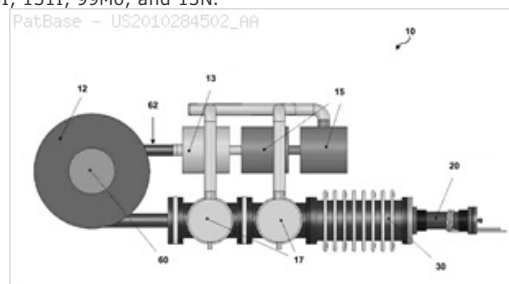
G21G1/10 H05H6/00 (Advanced/Non-invention);

G21G1/00 H05H6/00 (Core/Invention)

CPC: G21G1/10 H05H6/00

European: G21G1/10 H05H6/00

US: 376/190 376/190P



Family:

Publication number	Publication date	Application number	Application date
CA2710985 AA	20091126	CA20082710985	20081229
CA2710985 C	20170321	CA20082710985	20081229
CN101952899 A	20110119	CN200880125694	20081229
CN101952899 B	20140528	CN200880125694	20081229
EP2236016 A2	20101006	EP20080874437	20081229
EP2236016 B1	20170809	EP20080874437	20081229
JP2011508885 T2	20110317	JP20100540933T	20081229

JP5653757 B2	20150114	JP20100540933T	20081229
KR101591688 B1	20160204	KR20107016871	20081229
KR20100103652 A	20100927	KR20107016871	20081229
RU2010126346 A	20120210	RU20100126346	20081229
RU2496285 C2	20131020	RU20100126346	20081229
US2010284502 AA	20101111	US20080810958	20081229
US8837662 BB	20140916	US20080810958	20081229
WO09142669 A2	20091126	WO2008US88485	20081229
WO09142669 A3	20100225	WO2008US88485	20081229

Priority:

US20070017288P 20071228 US20080139985P 20081222 WO2008US88485 20081229
US20080810958 20081229

Probable Assignee: PHOENIX LLC

Assignee(s): (std): FONIKS NUKLIE LEHBS LLS ; PHOENIX ATOMIC LAB GMBH ; PHOENIX NUCLEAR LABS LLC ; PIEFER GREGORY

Assignee(s): PHOENIX LLC ; DEERFIELD MANAGEMENT CO LP ; DEERFIELD PRIVATE DESIGN FUND IV LP

Inventor(s): (std): PIEFER GREGORY ; GREGORY PIEFER ; PIFER GREGORI

Agent(s): TORYS LLP; GRUENECKER KINKELDEY STOCKMAIR AND SCHWANHAEUSSER ANWALTSSOZIETAET; GRUENECKER PATENT U RECHTSANWAELTE PARTG MBB; MICHAEL BEST AND FRIEDRICH LLP; FOLEY AND LARDNER LLP; WELCH TERESA J

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

19) Family number: 52217993 (US2012275557A)

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Title: PRODUCTION OF RADIONUCLIDE MOLYBDENUM 99 IN A DISTRIBUTED AND IN SITU FASHION

Abstract: A method and apparatus for producing Mo-99 from Mo-100 for the use of the produced Mo-99 in a Tc-99m generator without the use of uranium is presented. Both the method and apparatus employ high energy gamma rays for the transformation of Mo-100 to Mo-99. The high energy gamma rays are produced by exposing a metal target to a moderated neutron output of between 6 MeV and 14 MeV. The resulting Mo-99 spontaneously decays into Tc-99m and can therefore be used in a Tc-99m generator.

Classifications:

International (IPC 8-9): G21G1/06 G21G1/12

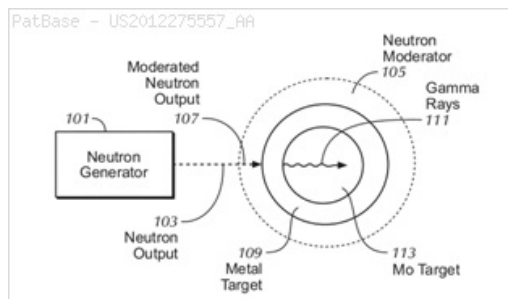
G21G4/02 (Advanced/Invention);

G21G1/00 (Advanced/Non-invention)

CPC: G21G4/02 G21G1/12 G21G2001/0036

European: G21G1/12 G21G4/02

US: 1/1 376/158 376/186



Family:

Publication number	Publication date	Application number	Application date
US2012275557 AA	20121101	US20120457174	20120426
US9318228 BB	20160419	US20120457174	20120426

Priority:

US20110479278P 20110426 US20120457174 20120426

Probable Assignee: TRUSTEES OF PRINCETON UNIV

Assignee(s): (std): ASCIONE GEORGE ; COHEN ADAM B ; GENTILE CHARLES A ; UNIV PRINCETON

Assignee(s): THE TRUSTEES OF PRINCETON UNIVERSITY ; TRUSTEES OF PRINCETON UNIV ; ENERGY UNITED STATES DEPARTMENT OF

Inventor(s): (std): GENTILE CHARLES A ; COHEN ADAM B ; ASCIONE GEORGE

Agent(s): MEAGHER EMANUEL LAKS GOLDBERG AND LIAO LLP