

G21G

CONVERSION OF CHEMICAL ELEMENTS; RADIOACTIVE SOURCES (applications of radiation in general [G21H 5/00](#); handling particles, e.g. neutrons, or electromagnetic radiation not otherwise provided for [G21K](#))

Definition statement

This place covers:

Methods and apparatus for the conversion of chemical elements, e.g. isotope production or transmutation where a change of atomic number takes place either externally induced or by radioactive decay.

Radioactive sources (solid, liquid or gas).

References

Limiting references

This place does not cover:

Conversion of nuclear fuel	G21C
Adaptations of reactors to facilitate experimentation or irradiation. Examples of such adaptations include modification of the reactor core to enable exposure of samples for investigative purposes	G21C 23/00
Applications of radiation in general	G21H 5/00
Handling particles.	G21K
Irradiation devices. These typically include arrangements to deliberately subject bodies or materials to ionising radiation in order to take advantage of known effects of the radiation thereon	G21K 5/00
X-ray tubes	H01J 35/00

Application-oriented references

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Radiopharmaceuticals	A61K 51/00
Applying radioactive material to the body	A61M36/00
Radiation therapy using radioactive sources	A61N 5/10
Detection by neutron activation	G01N 23/222
Conversion of chemical elements by thermonuclear reactions in fusion reactors	G21B
Nuclear reactors	G21C
Application of radiation from radioactive sources	G21H 5/00

Informative references

Attention is drawn to the following places, which may be of interest for search:

Preparations containing radioactive substances for use in therapy or testing in vivo	A61K 51/00
Separation of different isotopes of the same element	B01D 59/00

In fusion reactors	G21B
In nuclear reactors	G21C
By cosmic radiation	G21H 7/00
Handling particles or electromagnetic radiation not otherwise provided for	G21K
X-ray tubes	H01J 35/00
Gamma masers	H01S 4/00
In accelerators	H05H
Producing neutrons or other subatomic particles, X- or gamma rays:	

Special rules of classification

Indexing Codes are only used for [G21G 1/00](#), [G21G 1/0005](#) and [G21G 1/001](#) for indicating supplementary information. In all other cases multiple ECLA classes are assigned.

G21G 1/00

Arrangements for converting chemical elements by electromagnetic radiation, corpuscular radiation or particle bombardment, e.g. producing radioactive isotopes (separation of different isotopes of the same element [B01D 59/00](#))

Definition statement

This place covers:

- Apparatus and methods for transmutation and isotope production.
- Conversion isotope generators methods of isotope recovery from targets.
- Arrangements inside nuclear power reactors
- Arrangements outside nuclear power reactors, e.g. conversion by bombardment with electrically charged particles or neutrons.

Further information:

The indexing scheme under [G21G 1/00](#) covers: isotope delivery systems; methods for recovering isotopes. Individual subgroups are used to identify particular isotopes recovered from irradiated targets.

References

Limiting references

This place does not cover:

Separation of different isotopes of the same element (enrichment)	B01D 59/00
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Applications of electromagnetic radiation	G21H 5/00
Irradiation devices	G21K 5/00
Targets for nuclear reactions	H05H 6/00

Special rules of classification

[G21G 1/02](#)

Referring to reactors is intended for power reactors which primarily supply electricity to the power grid; otherwise [G21G 1/06](#) should be used.

[G21G 1/00](#)

May be assigned to inventions in other classes where isotope conversion, recovery or delivery takes place but is not the main focus.

[G21G 2001/0015](#) through [G21G 2001/0094](#) should only be used these particular isotopes are recovered. For more general methods, useful for large groups/lists of isotopes, [G21G 1/001](#) should be given.

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Transmutation	Conversion of nuclear waste to less problematic isotopes.
Generator	Shielded delivery system containing a mother isotope which can be eluted or "milked" to deliver an isotope product, which usually has a short half-life, e.g. Technetium-99m.

Synonyms and Keywords

In patent documents, the following abbreviations are often used:

Isotope delivery system	"Generator", "cow", ion exchange column.
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G21G 4/00

Radioactive sources (producing neutrons or other subatomic particles, X- or gamma rays, in fusion reactors [G21B](#), in nuclear reactors [G21C](#), by cosmic radiation [G21H 7/00](#), in accelerators [H05H](#); X-ray tubes [H01J 35/00](#); gamma masers [H01S 4/00](#))

Definition statement

This place covers:

- Sources of ionising radiation which emit according to radioactive decay.
- Neutron sources or other sources used generally or for medical applications.

References

Limiting references

This place does not cover:

Producing neutrons or other subatomic particles, X- or gamma rays in fusion reactors	G21B
Producing neutrons or other subatomic particles, X- or gamma rays in nuclear reactors	G21C
Producing neutrons or other subatomic particles, X- or gamma rays by cosmic radiation	G21H 7/00

Informative references

Attention is drawn to the following places, which may be of interest for search:

Radioactive dressings	A61M36/14
Radiation therapy	A61N 5/00
Filling medical containers	B65B 3/003
Filling medical containers and related operations	B65B 3/006
Producing neutrons or other subatomic particles, X- or gamma rays by using sources as tracers	G21H 5/02
X-ray tubes	H01J 35/00
Gamma masers	H01S 4/00
Plasma eUV sources	H05G 2/00
Production of accelerated electrically-charged particles or of neutrons, e.g. using accelerators	H05H

G21G 5/00**Alleged conversion of chemical elements by chemical reaction****Definition statement**

This place covers:

Alchemy, e.g. alleged induction of radioactive decay by chemical means.

References**Limiting references**

This place does not cover:

Cold fusion	G21B 3/00
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Special rules of classification

This main group should only be given when a change of atomic number by chemical means is explicitly disclosed. This may also include alleged induction of radioactive decay by chemical means.

G21G 7/00**Conversion of chemical elements not provided for in other groups of this subclass****Definition statement**

This place covers:

Miscellaneous apparatus or methods for converting elements or generating isotopes not induced by electromagnetic radiation, corpuscular radiation or particle bombardment.

Such methods which contradict standard physics.

Special rules of classification

This main group should only be given if no other group in this subclass can be assigned.