

## G21H

**OBTAINING ENERGY FROM RADIOACTIVE SOURCES; APPLICATIONS OF RADIATION FROM RADIOACTIVE SOURCES; UTILISING COSMIC RADIATION (measurement of nuclear or X-radiation G01T; fusion reactors G21B; nuclear reactors G21C; semiconductor devices sensitive to electro-magnetic or corpuscular radiation H01L31/00)**

### Definition statement

*This subclass/group covers:*

Arrangements for obtaining electrical energy from radioactive sources, e.g. from radioactive isotopes.

Arrangements for direct conversion of radiation energy from radioactive sources into forms of energy other than electrical energy.

Applications of radiation from radioactive sources or arrangements therefor.

Use of effects of cosmic radiation.

### References relevant to classification in this subclass

*This subclass/group does not cover:*

Fusion reactors	<a href="#">G21B</a>
Nuclear fission reactors	<a href="#">G21C</a>
Techniques for handling particles or electromagnetic radiation not otherwise provided for; irradiation devices, gamma- or X-ray microscopes	<a href="#">G21K</a>
Electric discharge tubes or discharge lamps	<a href="#">H01J</a>
Apparatus for generating ions to be introduced into non-enclosed gasses, e.g. into the atmosphere	<a href="#">H01T 23/00</a>

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

Use of radiation to produce mutation	<a href="#">A01H 1/06</a>
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in plants	
Preservation of meat, sausages, fish, eggs, fruit, vegetables or edible seeds by irradiation without heating effect	<a href="#">A23B 4/015</a> , <a href="#">A23B 5/015</a> , <a href="#">A23B 7/015</a> , <a href="#">A23B 9/06</a>
Preservation of milk or milk preparations by irradiation	<a href="#">A23C 3/07</a>
Preservation of non-alcoholic beverages or foodstuffs by irradiation without heating	<a href="#">A23L 2/50</a> , <a href="#">A23L 3/26</a>
Medicinal preparations obtained by treating materials with wave energy or particle radiation	<a href="#">A61K 41/00</a>
Methods or apparatus using radiation for disinfecting or sterilising materials or objects other than foodstuffs or contact lenses	<a href="#">A61L 2/08</a>
Radiation therapy; therapy using X-rays, gamma rays or particle-irradiation	<a href="#">A61N 5/00</a> , <a href="#">A61N 5/10</a>
Applying radioactive material to the body	<a href="#">A61M 37/0069</a> , <a href="#">A61N 5/10</a>
Direct application of radiation to physical, chemical or physico-chemical processes in general	<a href="#">B01J 19/08</a>
Use of radiation for separating dispersed particles from gases or vapour, e.g. air, by electrostatic effect	<a href="#">B03C 3/38</a>
Use of radiation for pre-treatment of surfaces to which liquids or other fluent materials are to be applied, or after-treatment of applied coatings	<a href="#">B05D 3/06</a>
Use of radiation in the working of plastics; after-treatment of articles without altering their shape; apparatus therefor	<a href="#">B29C 71/04</a>

Railway trackside devices actuated by radiation and controlled by interaction with a vehicle or train	<a href="#">B61L 1/10</a>
Railway trackside devices using radiation to control devices on a vehicle or train	<a href="#">B61L 3/06</a>
Polymerisation initiated by wave energy or particle radiation; in addition polymers	<a href="#">C08F 2/46</a> , <a href="#">C08F 2/54</a> , <a href="#">C08G 2/02</a>
Processes for treating or compounding macromolecular substances by wave energy or particle radiation	<a href="#">C08J 3/28</a>
Chemical treatment or coating of shaped articles made of macromolecular substances using wave energy or particle radiation	<a href="#">C08J 7/18</a>
Use of radiation for cracking of hydrocarbon oils	<a href="#">C10G 15/10</a> , <a href="#">C10G 32/04</a>
Use of radiation for reforming naphtha	<a href="#">C10G 35/16</a>
Use of radiation for pasteurisation, sterilisation, preservation, purification, clarification or ageing of alcoholic beverages	<a href="#">C12H 1/06</a> , <a href="#">C12H 1/16</a>
Use of radiation for bleaching fibres, threads, yarns, fabrics, feathers, or made-up fibrous goods, leather or furs	<a href="#">D06L 3/04</a>
Measuring angles, areas, length, thickness or similar dimensions, or irregularities of surfaces or contours, using wave or particle radiation	<a href="#">G01B 15/00</a>
Transducers not specially adapted for a specific variable using wave or particle radiation derived from a radioactive source	<a href="#">G01D 5/50</a> , <a href="#">G01D 5/62</a>

Investigating fluid tightness of structures using radioactive material	<a href="#">G01M 3/20</a>
Investigating or analysing materials by the use of wave or particle radiation	<a href="#">G01N 23/00</a>
Investigating or analysing materials through the ionisation of gases, using wave or particle radiation to ionise a gas	<a href="#">G01N 27/64</a>
Chemical analysis of biological material; immunoassay or bio-specific binding assays involving radioactive-labelled substances	<a href="#">G01N 33/534</a> , <a href="#">G01N 33/60</a>
Geophysics; prospecting or detecting using primary nuclear radiation sources	<a href="#">G01V 5/08</a>
Fire alarms or alarms responsive to explosion, actuated by the presence of smoke or gas detected by an ionisation chamber	<a href="#">G08B 17/11</a>
Carrying off electrostatic charges by means of ionising radiation	<a href="#">H05F 3/06</a>

### **Informative references**

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

Measurement of nuclear or X-radiation	<a href="#">G01T</a>
Particle spectrometer ion sources or ion guns using particle bombardment, e.g. ionisation chambers	<a href="#">H01J 49/14</a>
Semiconductor devices sensitive to electromagnetic or corpuscular radiation	<a href="#">H01L 31/00</a>

## Special rules of classification within this subclass

Classification of both important (invention) information and additional information is obligatory.

### G21H 1/00

**Arrangements for obtaining electrical energy from radioactive sources, e.g. from radioactive isotopes, [N: nuclear or atomic batteries]**

#### Informative references

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

Photoelectric discharge tubes not involving the ionization of a gas	<a href="#">H01J 40/00</a>
Discharge tubes functioning as thermionic generators	<a href="#">H01J 45/00</a>
Tubes for determining the presence, intensity, density or energy of radiation or particles	<a href="#">H01J 47/00</a>
Thermoelectric devices comprising a junction of dissimilar materials	<a href="#">H01L 35/00</a>

### G21H 3/00

**Arrangements for direct conversion of radiation energy from radioactive sources into forms of energy other than electric energy, e.g. [N: into] light [N: or mechanic energy] (lasers H01S3/00; [N: gamma masers H01S4/00])**

#### References relevant to classification in this group

*This subclass/group does not cover:*

Lasers	<a href="#">H01S 3/00</a>
Lasers pumped by high energy nuclear particles	<a href="#">H01S 3/0957</a>
Gamma masers	<a href="#">H01S 4/00</a>

## G21H 5/00

Applications of radiation from radioactive sources or arrangements therefor (producing mutation in plants A01H1/06; preservation of dairy products A23C; preservation of foodstuffs A23L3/26; for therapeutic purposes A61N5/10; in chemical, physical or physicochemical processes in general B01J19/08; in electrostatic separation B03C3/38; for after-treatment of coatings applied as liquids or other fluent materials B05D3/06; for action between electric vehicles and tracked apparatus B61L1/10, B61L3/06; introducing isotopes into organic compounds C07B59/00; for preparation of organic chemical compounds C07, C08, e.g. C08F2/46; for treating macromolecular substances or articles made therefrom B29C71/04, C08J3/28, C08J7/18; for cracking of hydrocarbon oils C10G15/00, C10G32/04; for reforming naphtha C10G35/16; preservation or ageing of products obtained from fermentation processes C12H1/06, C12H1/16; for bleaching fibres D06L3/04; measuring G01; irradiation devices, gamma- or X-ray microscopes G21K; in discharge tubes H01J; apparatus for generating ions to be introduced into non-enclosed gases, e.g. into the atmosphere, H01T23/00; for carrying-off electrostatic charges H05F3/06)

### Informative references

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

Producing mutations in plants	<a href="#">A01H 1/06</a>
Preservation of dairy products	<a href="#">A23C</a>
Preservation of cream, butter and cheese	<a href="#">A23C 13/08</a> , <a href="#">A23C 15/18</a> , <a href="#">A23C 19/097</a>
Preservation of foodstuffs	<a href="#">A23L 3/26</a>
Preparations containing radioactive substances for use in therapy or testing in vivo	<a href="#">A61K 51/00</a>
Applications of radiation for therapeutic purposes	<a href="#">A61N 5/10</a>
Applications of radiation in chemical, physical or physicochemical processes	<a href="#">B01J 19/08</a>

in general	
Applications of radiation in electrostatic separation	<a href="#">B03C 3/38</a>
Applications of radiation for after treatment of coatings applied as liquids or other fluent materials	<a href="#">B05D 3/06</a>
Applications of radiation for action between electric vehicles and tracked apparatus	<a href="#">B61L 1/10</a> , <a href="#">B61L 3/06</a>
Applications of radiation for treating macromolecular substances or articles made therefrom	<a href="#">B29C 71/04</a> , <a href="#">C08J 3/28</a> , <a href="#">C08J 7/18</a>
Introducing isotopes into organic compounds	<a href="#">C07B 59/00</a>
Introducing isotopes into organic compounds	<a href="#">C07B 59/00</a>
Applications of radiation for preparation of organic chemical compounds	C07, C08, <a href="#">C08F 2/46</a>
Applications of radiation for cracking of hydrocarbon oils	<a href="#">C10G 15/00</a> , <a href="#">C10G 32/04</a>
Applications of radiation for reforming naphtha	<a href="#">C10G 35/16</a>
Preservation or ageing of products obtained from fermentation processes	<a href="#">C12H 1/06</a> , <a href="#">C12H 1/16</a>
Applications of radiation for bleaching fibres	<a href="#">D06L 3/04</a>
Measuring	G01
Irradiation devices, gamma- or X-ray microscopes	<a href="#">G21K</a>
Applications of radiation in discharge tubes	<a href="#">H01J</a>

Apparatus for generating ions to be introduced into non-enclosed gases, e.g. into the atmosphere	<a href="#">H01T 23/00</a>
Applications of radiation for carrying-off electrostatic discharges	<a href="#">H05F 3/06</a>

## **G21H 7/00**

### **Use of effects of cosmic radiation**