

H10K

ORGANIC ELECTRIC SOLID-STATE DEVICES

Definition statement

This place covers:

Electric solid-state devices having organic materials as the active layers, or using a combination of organic materials and other materials as the active layers.

This includes the following kind of devices:

- organic devices specially adapted for rectifying, amplifying, oscillating or switching, or capacitors or resistors having potential barriers, e.g. organic transistors or organic diodes;
- organic devices that are sensitive to infrared radiation, light, electromagnetic radiation of shorter wavelength or corpuscular radiation, e.g. organic solar cells or organic photodiodes;
- organic light-emitting devices, e.g. organic light-emitting diodes or organic light-emitting transistors.

Processes and apparatus specially adapted for the manufacture or treatment of such devices.

Organic materials used in active layers, layers having high carrier mobility or electrodes of devices covered by this subclass.

References

Limiting references

This place does not cover:

Organic resistors without potential barriers and not being specially adapted for integrated devices	H01C
Organic capacitors, e.g. organic polymer capacitors, without potential barriers and not being specially adapted for integrated devices	H01G
Organic electronic memory devices	H10B
Organic thermoelectric devices; Organic thermomagnetic devices	H10N 10/00 , H10N 15/00 , H10N 19/00
Organic piezoelectric or electrostrictive devices	H10N 30/00 , H10N 39/00
Organic magnetostrictive devices	H10N 35/00 , H10N 39/00
Organic galvanomagnetic or Hall-effect devices	H10N 50/00 , H10N 52/00 , H10N 59/00
Organic superconducting devices	H10N 60/00 , H10N 69/00
Organic solid-state devices without potential barriers, and specially adapted for rectifying, amplifying, oscillating or switching	H10N 70/00 , H10N 79/00

References out of a residual place

Examples of places in relation to which this place is residual:

Organic magnets, inductors or transformers	H01F
Organic electrolytic devices	H01G 9/00
Organic batteries	H01M
Organic waveguides	H01P

Informative references

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

Use of organic solid-state devices for measuring	G01
Control arrangements or circuits for electroluminescent panels comprising organic light-emitting diodes [OLED]	G09G 3/3208
Organic electromechanical resonators	H03H
Organic loudspeakers, microphones, gramophone pick-ups or like acoustic electromechanical transducers, e.g. organic piezoelectric microphones	H04R
Organic printed circuits, hybrid circuits, casings or constructional details thereof	H05K

Special rules of classification

The scheme covers five main aspects: (a) devices, e.g. components, are covered by groups [H10K 10/00](#), [H10K 30/00](#) and [H10K 50/00](#) (b) integrated devices and assemblies of multiple devices are covered by the groups [H10K 19/00](#), [H10K 39/00](#), [H10K 59/00](#) and [H10K 65/00](#), (c) processes and apparatus that are specially adapted for manufacturing or treating a device are covered in [H10K 71/00](#), (d) constructional details that may be generic to the devices of the subclass are covered in [H10K 77/00](#), (e) organic materials used in active layers, in layers having high carrier mobility, and in electrodes are covered in [H10K 85/00](#).

Determination should be made as which of the five aspect(s) is/are inventive. Classification of the inventive aspect(s) should be made using inventive allocation in the appropriate part(s) of the scheme. Classification of the remaining aspects should then be made using additional allocation only if disclosed in specific embodiments, e.g. a concrete device embodiment, or a synthesis method.

In this subclass, the periodic system used is the I to VIII group system indicated in the Periodic Table under Note (3) of section [C](#).

Glossary of terms

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

chip	a piece of a wafer or a substrate that has been processed to contain devices therein or thereon. The expression "diced chip" refers to the result of dicing a wafer or a substrate into a plurality of chips, whereas "undiced chip" refers to a chip before dicing or with no dicing.
device	an electric circuit element (e.g. diode, transistor, LED, etc.); (depending on the context) can also refer to an integrated device (e.g. CMOS-IC, DRAM device, etc.). A device may be in the form of a bare or packaged chip.
dopant	the atoms or compounds added to a material during doping
doping	the intentional addition of a small quantity of atoms or compounds into a material to achieve a desired characteristic, e.g. to produce an n-type or p-type material
individual	refers to: an electric circuit element not being an integrated device; or a component of an integrated device. Examples of individual devices include: diodes, transistors, photovoltaic cells, Josephson-junction devices, light-emitting diodes [LED], organic LEDs or a single LED component within an integrated device.

integrated device	a device consisting of a plurality of semiconductor or other solid-state electric circuit elements formed in or on a common substrate
integrated circuit	an integrated device where all the electric circuit elements (e.g. diodes, transistors, LEDs, etc.) are formed in or on a common substrate, including interconnections between the elements
component	an electric circuit element (e.g. diode, transistor, LED, etc.) that is one of a plurality of elements formed in or on a common substrate, e.g. in an integrated device
wafer	it can be one of the following: (a) a slice of semiconductor or electric solid-state active material. For example: a slice of silicon; a slice of a semiconducting compound, e.g. gallium nitride [GaN]; a slice of lithium tantalate [LiTaO ₃] for superconductor applications. (b) A multilayered laminate, having at least one layer of semiconductor or electric solid-state active material, the layer being meant to be processed into devices. For example: silicon-on-insulator [SOI]; silicon-on-glass [SOG]; silicon-on-sapphire [SOS]; a composite wafer comprising silicon carbide [SiC] on polycrystalline silicon [Si] support; a layer of semiconducting nanowires on glass. A wafer is typically processed by (e.g.) deposition, etching, doping or diffusion, and is then typically diced into chips.
body	the region of semiconductor (resp. solid-state) material(s) within which, or at the surface of which, the physical effects that are characteristic of the device occur, and any bordering semiconductor (resp. solid-state) material(s) that are contiguous with this region. Examples: in a field-effect transistor [FET], the physical effects occur in the channel region between the source and the drain. The semiconductor body includes the channel region, the source and drain regions, and any contiguous semiconductor material; in a light-emitting diode [LED], the physical effects occur at a junction of active semiconductor layers. The semiconductor body includes these active semiconductor layers and any contiguous semiconductor layers, such as buffer layers, possibly a growth substrate, etc., that are between the cathode and anode electrodes; in a thermoelectric device, the solid-state body includes all solid-state materials in the path of current between the electrodes.
electrode	a conductive region in or on the semiconductor body or solid-state body of a device (and other than the body itself) which exerts an electrical influence on the body, irrespective of whether or not an external electrical connection is made thereto. The term covers metallic regions which exert electrical influence on the body through an insulating region (e.g. in intentional non-parasitic capacitive coupling), or inductive coupling arrangements. In a capacitive coupling arrangement, the dielectric region is regarded as part of the electrode. The overall conductive wiring may comprise multiple portions. In such a case, only the wiring portions that exert an electrical influence on the body are considered portions of the electrode. Examples: conductive layer(s) in direct physical contact with the body; conductive region(s) exerting an inductive coupling onto the body; a multilayer structure which exerts influence on the body through an insulating region, e.g. in intentional non-parasitic capacitive coupling.

interconnection	a conductive arrangement for conducting electric current from an electrode of a circuit element to another part of the circuit. Examples include metal wirings.
container	a solid construction in which (one or more) devices are placed, or which is formed around the devices, for forming packaged devices. A container requires a partial or total enclosure and it may also comprise a filling.
encapsulation	an enclosure consisting of (one or more) layers, e.g. comprising organic polymers, which at least partially enclose the (one or more) devices, thereby protecting them. An encapsulation is often used to hermetically seal devices.
field-effect	refers to semiconductor technology wherein a voltage applied to a gate electrode creates an electric field that allows for control of current near the interface of the gate and the body, e.g. to create an inversion channel between the source and drain of a MOSFET
package	the collection of all elements, which are external to the chip, that protect the chip or connect it to another object. Package therefore covers encapsulations, containers, package substrates, interposers, heatsinks or the like. Package does not include objects at a higher system level, like circuit boards and beyond, e.g. a housing in which the circuit board is enclosed.
unipolar	refers to semiconductor technology that primarily involves one type only of charge carrier, i.e. it involves either holes or electrons but not both
bipolar	refers to semiconductor technology that involves multi-carrier-type operation, i.e. which simultaneously uses both electrons and holes as charge carriers
MIS	metal-insulator-semiconductor
MOS	metal-oxide-semiconductor
FET	field-effect transistor
MISFET	metal-insulator-semiconductor field-effect transistor
TFT	thin-film transistor
active material	the material within which the physical effects that are characteristic of the device occur
auxiliary electrode	one part of a multi-layered electrode, often being metallic and intended to increase the conductivity of transparent oxide electrodes
coordination compound	a material having a chemical structure in which a central atom is chemically bonded to surrounding nonmetal atoms or groups of atoms. The central atom may be a metal atom or may be a metalloid (e.g. B, Si, Ge, As, Sb, Te or Po).
electroluminescent layer, emissive layer	the layer within which electrons and holes combine, resulting in light emission
organic device	a device that comprises one or more organic materials as the active material, e.g. using only organic active materials or e.g. using a combination of an organic material and another material
radiation-sensitive	refers to a device or a component that is sensitive to infrared radiation, light, electromagnetic radiation of shorter wavelength or corpuscular radiation

tandem OLED	an OLED that comprises multiple electroluminescent units between one set of electrodes and a charge generation layer between the electroluminescent units
tandem PV cell	a photovoltaic cell that comprises multiple stacked photovoltaic units, e.g. p-n junctions, between one set of electrodes. Often each unit is made from a semiconductor of different bandgap energy, so each is sensitive to a different part of the electromagnetic spectrum.
terminal	the electrode or interconnection within a device, which serves as a connecting point between electrodes or interconnections within the device and interconnections that may be in the device's package or may be external to the device. An example is a bond pad on the cathode of an OLED, which may connect between the cathode electrode and a bonding wire in the OLED's package.
tiled display	a display that comprises a juxtaposition of smaller interconnected panels in order to achieve a large-area display

Synonyms and Keywords

In patent documents, the following abbreviations are often used:

CCM	Colour changing material
EBL	Electron blocking layer
EIL	Electron injection layer
EL	Electroluminescent; or electroluminescent layer
ETL	Electron transporting layer
FTO	Fluorine doped tin oxide
HBL	Hole blocking layer
HIL	Hole injection layer
HOIP	Hybrid organic-inorganic perovskite
HOMO	Highest occupied molecular orbital
HTL	Hole transporting layer
ITO	Indium tin oxide
LEC	Light-emitting electrochemical cell
LUMO	Lowest unoccupied molecular orbital
OEL	Organic electroluminescent layer
OLED	Organic light-emitting diode
OTFT	Organic thin-film transistor
PLED	Polymer light-emitting diode
RGB	Red Green Blue
RGBW	Red Green Blue White
TCO	Transparent conductive oxide

H10K 10/00

Organic devices specially adapted for rectifying, amplifying, oscillating or switching; Organic capacitors or resistors having potential barriers (integrated devices or assemblies of multiple devices [H10K 19/00](#))

Definition statement

This place covers:

Organic devices wherein an electrical input is rectified, amplified, oscillated or switched.

Active resistors or capacitors using organic materials as the active layers, or using a combination of organic materials with other material as the active layers.

Examples include:

- Organic variable resistors;
- Organic variable capacitors;
- Organic diodes;
- Organic transistors.

References

Limiting references

This place does not cover:

Organic integrated devices, or assemblies of multiple devices	H10K 19/00
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Informative references

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

Manufacture or treatment specially adapted for organic devices	H10K 71/00
Constructional details generally applicable to all organic solid-state devices, not covered by this group	H10K 77/00
Organic material used in active layers, in layers having high carrier mobility or in electrodes	H10K 85/00
Individual inorganic semiconductor devices specially adapted for rectifying, amplifying, oscillating or switching; Individual inorganic resistors or capacitors having potential barriers; Individual resistors, capacitors or inductors having no potential barriers, and specially adapted for integration with other semiconductor components	H10D 1/00 - H10D 48/00

H10K 10/20

Organic diodes

References

Informative references

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

Organic light-sensitive diodes	H10K 30/10 , H10K 30/20 , H10K 30/30 , H10K 30/40
Organic light-emitting diodes	H10K 50/10

H10K 10/46

Field-effect transistors, e.g. organic thin-film transistors [OTFT] ([H10K 10/43](#) takes precedence)

References

Limiting references

This place does not cover:

Bipolar transistors, e.g. organic bipolar junction transistors [OBJTs]	H10K 10/43
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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:

CHEMFETs	G01N 27/414
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Informative references

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

Organic light-sensitive transistors	H10K 30/65
Organic light-emitting transistors	H10K 50/30
Organic thin film transistors in an organic light-emitting display	H10K 59/125

H10K 19/00

Integrated devices, or assemblies of multiple devices, comprising at least one organic element specially adapted for rectifying, amplifying, oscillating or switching, covered by group [H10K 10/00](#)

Definition statement

This place covers:

Integrated devices comprising at least one organic component specially adapted for rectifying, amplifying, oscillating or switching covered by group [H10K 10/00](#).

Assemblies of multiple devices comprising at least one organic device specially adapted for rectifying, amplifying, oscillating or switching covered by group [H10K 10/00](#).

References

Informative references

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

Individual organic devices specially adapted for rectifying, amplifying, oscillating or switching	H10K 10/00
Organic light-emitting display comprising organic thin film transistors	H10K 59/125
Manufacture or treatment specially adapted for organic devices	H10K 71/00
Constructional details generally applicable to all organic solid-state devices, not covered by this group	H10K 77/00

Integrated devices comprising inorganic components specially adapted for rectifying, amplifying, oscillating or switching	H10D 84/00 - H10D 89/00
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H10K 30/00

Organic devices sensitive to infrared radiation, light, electromagnetic radiation of shorter wavelength or corpuscular radiation (integrated devices or assemblies of multiple devices [H10K 39/00](#), [H10K 65/00](#); electrolytic light-sensitive devices [H01G 9/20](#))

Definition statement

This place covers:

Devices specially adapted for sensing infra-red radiation, light, electro-magnetic radiation of shorter wavelength or corpuscular radiation and adapted for the conversion of the energy of such radiation into electrical energy or for the control of electrical energy by such radiation using organic materials as the active layers, or using a combination of organic materials with other material as the active layers.

Examples include:

- Organic solar cells
- Organic photodiodes
- Organic phototransistors
- Organic photoresistors or photoconductors

[H10K 30/50](#) - [H10K 30/57](#) specifically cover photovoltaic cells. [H10K 30/60](#) - [H10K 30/65](#) specifically cover photodiodes, photoresistors and phototransistors. [H10K 30/10](#) - [H10K 30/451](#) cover structural or junction aspects of photovoltaic cells, photodiodes, photoresistors and phototransistors.

References

Limiting references

This place does not cover:

Organic integrated devices, or assemblies of multiple devices	H10K 39/00 , H10K 65/00
Electrolytic light-sensitive devices	H01G 9/20

Informative references

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

Organic light-emitting devices	H10K 50/00
Manufacture or treatment specially adapted for organic devices	H10K 71/00
Constructional details generally applicable to all organic solid-state devices, not covered by this group	H10K 77/00
Organic material used in active layers, in layers having high carrier mobility, or in electrodes	H10K 85/00
Inorganic radiation-sensitive devices	H10F

H10K 39/00

Integrated devices, or assemblies of multiple devices, comprising at least one organic radiation-sensitive element covered by group [H10K 30/00](#)

Definition statement

This place covers:

- Integrated devices comprising at least one component specially adapted for sensing infra-red radiation, light, electro-magnetic radiation of shorter wavelength or corpuscular radiation and adapted for the conversion of the energy of such radiation into electrical energy or for the control of electrical energy by such radiation using organic materials as the active layers, or using a combination of organic materials with other material as the active layers; and
- Assemblies of multiple devices, comprising at least one device specially adapted for sensing infra-red radiation, light, electro-magnetic radiation of shorter wavelength or corpuscular radiation and adapted for the conversion of the energy of such radiation into electrical energy or for the control of electrical energy by such radiation using organic materials as the active layers, or using a combination of organic materials with other material as the active layers.

Such as:

- Integrated devices comprising organic solar cells
- Organic photovoltaic modules
- Organic image sensors (imager structures)
- Organic X-ray detectors

References

Informative references

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

Integrated devices, e.g. driving circuitry, comprising organic components specially adapted for rectifying, amplifying, oscillating or switching	H10K 19/00
Individual organic radiation-sensitive components of these integrated devices	H10K 30/00
Organic optocouplers	H10K 65/00
Manufacture or treatment specially adapted for organic devices	H10K 71/00
Constructional details generally applicable to all organic solid-state devices, not covered by this group	H10K 77/00
Integrated devices, e.g. driving circuitry, comprising inorganic components specially adapted for rectifying, amplifying, oscillating or switching	H10D 84/00 - H10D 89/00
Integrated devices comprising inorganic radiation-sensitive components	H10F 19/00 , H10F 39/00

H10K 50/00

Organic light-emitting devices (integrated devices or assemblies of multiple devices [H10K 59/00](#), [H10K 65/00](#); organic semiconductor lasers [H01S 5/36](#))

Definition statement

This place covers:

Organic electrical-light transducers wherein an electrical input is converted to a light output, such as organic light-emitting diodes [OLED] or organic light-emitting transistors.

References

Limiting references

This place does not cover:

Organic integrated devices, or assemblies of multiple devices	H10K 59/00 , H10K 65/00
Organic semiconductor lasers	H01S 5/36

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:

Lighting devices for vehicle interior	B60Q 3/00
Light sources using semiconductor devices as light-generating elements, e.g. using light-emitting diodes [LED] or lasers	F21K 9/00
Lighting devices intended for fixed installation	F21S 8/00
Illumination devices for LCDs	G02F 1/1336
Indicating arrangements making use of semiconductor devices	G09F 9/33
Illuminated signs	G09F 13/00

Informative references

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

Manufacture or treatment specially adapted for organic devices	H10K 71/00
Constructional details generally applicable to all organic solid-state devices, not covered by this group	H10K 77/00
Organic material used in active layers, in layers having high carrier mobility or in electrodes	H10K 85/00
Luminescent or electroluminescent materials	C09K 11/00
Light sources using luminescence, e.g. lamps based on OLEDs	F21K 2/00
Details of lighting devices, of general application	F21V
Control arrangements or circuits, of interest only in connection with visual indicators other than cathode-ray tubes, e.g. control arrangements for OLED displays	G09G 3/00
Electroluminescent light sources	H05B 33/00
Inorganic light-emitting diodes	H10H 20/00

Synonyms and Keywords

In patent documents, the following abbreviations are often used:

EL	Electroluminescent, electroluminescent layer
OEL	Organic electroluminescent layer
EIL	Electron injection layer
HIL	Hole injection layer
ETL	Electron transporting layer
HTL	Hole transporting layer

EBL	Electron blocking layer
HBL	Hole blocking layer
LEC	Light-emitting electrochemical cells
OLED	Organic light-emitting diode
TOLED	Transparent OLED
AMOLED display	Active matrix OLED display
PMOLED display	Passive matrix OLED display
OTFT	Organic thin film transistor
TFT	Thin film transistor
CCM	Colour changing medium
RGB	Red Green Blue
RGBW	Red Green Blue White

H10K 59/00

Integrated devices, or assemblies of multiple devices, comprising at least one organic light-emitting element covered by group [H10K 50/00](#)

Definition statement

This place covers:

Integrated devices that comprise at least one organic light-emitting component;

Assemblies of multiple devices, comprising at least one organic light-emitting device.

Examples include:

- Arrays of organic light-emitting diodes [OLEDs], e.g. OLED display
- An OLED integrated with a MOSFET

[H10K 59/10](#) covers only OLED displays, whereas [H10K 59/30](#) - [H10K 59/90](#) cover both displays and non-displays.

References

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:

Lighting devices for vehicle interior	B60Q 3/00
Light sources using semiconductor devices as light-generating elements, e.g. using light-emitting diodes [LED] or lasers	F21K 9/00
Lighting devices intended for fixed installation	F21S 8/00
Illumination devices, e.g. backlights, for LCDs	G02F 1/1336
Indicating arrangements making use of semiconductor devices	G09F 9/33
Illuminated signs	G09F 13/00

Informative references

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

Individual organic light-emitting components of these integrated devices	H10K 50/00
Integrated devices comprising at least one organic light-emitting component and at least one organic radiation-sensitive component, e.g. organic opto-couplers	H10K 65/00
Manufacture or treatment specially adapted for organic devices	H10K 71/00
Constructional details generally applicable to all organic solid-state devices, not covered by this group	H10K 77/00
Luminescent, e.g. electroluminescent materials	C09K 11/00
Light sources using luminescence, e.g. lamps based on OLEDs	F21K 2/00
Details of lighting devices, of general application	F21V
Liquid crystal displays [LCD]	G02F 1/133
Control arrangements or circuits, of interest only in connection with visual indicators other than cathode-ray tubes, e.g. control arrangements for OLED displays	G09G 3/00
Plasma displays	H01J 11/00
Field emission displays	H01J 31/00
Electroluminescent light sources	H05B 33/00
Circuit arrangements for operating LEDs comprising organic material	H05B 45/60
Integrated devices comprising inorganic light-emitting components, e.g. LED displays	H10H 29/10

Glossary of terms

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

OLED display	Organic light emitting diode display
TOLED display	Transparent OLED display
AMOLED display	Active matrix OLED display
PMOLED display	Passive matrix OLED display
OTFT array	Organic thin film transistor array
TFT array	Thin film transistor array
CCM	Colour changing medium
RGB	Red Green Blue
RGBW	Red Green Blue White

H10K 59/10

OLED displays

Relationships with other classification places

[H10K 59/10](#) covers only OLED displays. [H10K 59/30](#) - [H10K 59/90](#) cover displays, non-display integrated devices and non-display assemblies of multiple devices.

References

Informative references

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

Control arrangements for OLED displays	G09G 3/3208
TFT arrays, per se	H10D 86/40 , H10D 86/60

H10K 65/00

Integrated devices, or assemblies of multiple devices, comprising at least one organic light-emitting element and at least one organic radiation-sensitive element, e.g. organic opto-couplers (organic image sensors integrated with organic light-emitting devices [H10K 39/34](#); OLED displays integrated with photosensors [H10K 59/13](#))

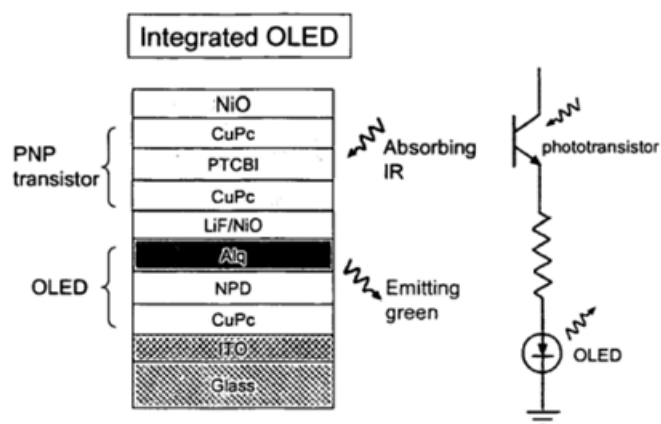
Definition statement

This place covers:

Integrated devices comprising at least one organic light-emitting component and at least one organic radiation-sensitive component, e.g. organic optocouplers;

Assemblies of multiple devices, comprising at least one organic light-emitting device and at least one organic radiation-sensitive device, e.g. organic optocouplers

Example:



The example shows a combination of an organic phototransistor with an OLED.

References

Limiting references

This place does not cover:

Organic image sensors integrated with organic light-emitting diodes	H10K 39/34
OLED displays integrated with photosensors	H10K 59/13

Informative references

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

Individual organic radiation-sensitive components of these integrated devices	H10K 30/00
Individual organic light-emitting components of these integrated devices	H10K 50/00
Manufacture or treatment specially adapted for organic devices	H10K 71/00
Constructional details generally applicable to all organic solid-state devices, not covered by this group	H10K 77/00
Inorganic optocouplers	H10F 55/00

H10K 71/00**Manufacture or treatment specially adapted for the organic devices covered by this subclass****Definition statement**

This place covers:

Processes or apparatus specially adapted for the formation of organic solid-state devices, including the formation, patterning or treatment of the organic materials used in active layers, in layers having high carrier mobility or in electrodes of an organic solid-state device.

References**Informative references**

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

Spraying apparatus	B05B 7/00
Processes for applying liquids or other fluent materials	B05D 1/00
Ink jet printers	B41J 2/01
Printing processes to produce particular kinds of printed work	B41M 3/00
Surface treatment of glass substrates by at least two coatings	C03C 17/34
Joining glass to inorganic material or glass	C03C 27/00
Etching, surface-brightening or pickling compositions	C09K 13/00
Coating by vacuum evaporation, sputtering or by ion implantation of the coating forming material	C23C 14/00
Chemical coating by decomposition of gaseous compounds	C23C 16/00
Photomechanical, e.g. photolithographic, production of textured or patterned surfaces	G03F 7/00
Manufacture or treatment for semiconductor devices	H10P

H10K 77/00

Constructional details of devices covered by this subclass and not covered by groups [H10K 10/80](#), [H10K 30/80](#), [H10K 50/80](#) or [H10K 59/80](#)

Definition statement

This place covers:

This place covers details that are generic or generally applicable to all device types of [H10K](#), e.g. transparent or flexible substrates.

References

Informative references

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

Constructional details specific to organic devices specially adapted for rectifying, amplifying, oscillating or switching, or organic capacitors or resistors having potential barriers	H10K 10/80
Constructional details specific to organic radiation-sensitive devices	H10K 30/80
Constructional details specific to organic light-emitting devices	H10K 50/80
Conductors or conductive bodies characterised by the conductive materials	H01B 1/00
Insulators or insulating bodies characterised by the insulating materials	H01B 3/00

H10K 85/00

Organic materials used in the body or electrodes of devices covered by this subclass

Definition statement

This place covers:

Organic materials in devices of this subclass, selected for their electrical or other properties, and used in

- Active layers, e.g. channel layers or light-emitting layers
- Layers having high carrier mobility, e.g. electron or hole transport layers
- Electrodes

References

Informative references

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

Carbon; Compounds thereof, e.g. Fullerenes	C01B 32/00
Cyclic hydrocarbons containing rings other than, or in addition to, six-membered aromatic rings	C07C 13/00
Cyclic hydrocarbons containing only six-membered aromatic rings as cyclic parts	C07C 15/00
Ketones; Ketenes	C07C 49/00
Quinones	C07C 50/00

Compounds containing amino groups bound to a carbon skeleton	C07C 211/00
Heterocyclic compounds	C07D
Macromolecular compounds obtained by reactions forming a carbon-to-carbon link in the main chain of the macromolecule	C08G 61/00
Macromolecular compounds obtained by reactions forming a linkage containing nitrogen with or without oxygen or carbon in the main chain of the macromolecule	C08G 73/00
Dyes with anthracene nucleus not condensed with any other ring	C09B 1/00
Dyes with an anthracene nucleus condensed with one or more carbocyclic rings	C09B 3/00
Dyes with an anthracene nucleus condensed with one or more heterocyclic rings with or without carbocyclic rings	C09B 5/00
Acridine dyes	C09B 15/00
Methine or polymethine dyes, e.g. cyanine dyes	C09B 23/00
Porphines; Azaporphines	C09B 47/00
Quinacridones	C09B 48/00
Dyes of natural origin prepared from natural sources, e.g. vegetable sources	C09B 61/00
Luminescent, e.g. electroluminescent, chemoluminescent materials	C09K 11/00
Etching, surface-brightening or pickling compositions	C09K 13/00
Liquid crystal materials	C09K 19/00
Organic conductors, in general	H01B 1/12
Organic insulators, in general	H01B 3/18

Special rules of classification

Special rules for classifying chemical compounds:

Markush formulae or generic formulae are not classified, only concrete embodiments or examples are classified. Simple lists of known compounds (without application in an example or embodiment) are not classified.

Fullerenes and carbon nanotubes are considered to be organic material. Graphene is considered to be inorganic.

In addition to the polymer classification, [H10K 85/10](#), the side-chains of aromatic or aliphatic polymers may be classified in the appropriate subgroup (e.g. [H10K 85/30](#), [H10K 85/40](#), [H10K 85/50](#), [H10K 85/60](#)).

Aromatic or aliphatic polymers comprising a metal complex in their main chain are classified in both [H10K 85/10](#) and in [H10K 85/30](#).

Silicon containing compounds are classified in [H10K 85/40](#) and are additionally classified in in [H10K 85/10](#), [H10K 85/20](#), [H10K 85/30](#), [H10K 85/50](#) and/or [H10K 85/60](#) as appropriate.

Ligands of metal complexes are not additionally classified in [H10K 85/60](#).