

# CPC COOPERATIVE PATENT CLASSIFICATION

## H ELECTRICITY

(NOTE omitted)

## H10 SEMICONDUCTOR DEVICES; ELECTRIC SOLID-STATE DEVICES NOT OTHERWISE PROVIDED FOR

## H10K ORGANIC ELECTRIC SOLID-STATE DEVICES

### NOTES

1. This subclass covers:
  - individual organic electric solid-state devices, i.e. electric solid-state devices comprising organic material in the active part;
  - integrated devices, or assemblies of multiple devices, comprising such elements.
2. This subclass does not cover:
  - organic electronic memory devices, which are covered by subclass [H10B](#);
  - organic thermoelectric devices, organic thermomagnetic devices, organic piezoelectric devices, organic electrostrictive devices, organic magnetostrictive devices, organic galvanomagnetic devices, organic Hall-effect devices, organic superconducting devices or organic solid-state devices having no potential barriers, and specially adapted for rectifying, amplifying, oscillating or switching, which are covered by subclass [H10N](#);
  - organic resistors having no potential barriers and not specially adapted for integrated devices, which are covered by subclass [H01C](#);
  - organic capacitors having no potential barriers and not specially adapted for integrated devices, which are covered by subclass [H01G](#).
3. 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](#).
4. In this subclass, it is desirable to add the indexing codes of groups [{H10K 2101/00 - H10K 2102/00}](#).

### Organic devices specially adapted for rectifying, amplifying, oscillating or switching

**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](#))**

10/10 . Organic capacitors or resistors having potential barriers

10/20 . Organic diodes

10/23 . . Schottky diodes

10/26 . . Diodes comprising organic-organic junctions

10/29 . . Diodes comprising organic-inorganic heterojunctions

10/40 . Organic transistors

10/43 . . Bipolar transistors, e.g. organic bipolar junction transistors [OBT]

10/46 . . Field-effect transistors, e.g. organic thin-film transistors [OTFT] ([H10K 10/43](#) takes precedence)

10/462 . . . {Insulated gate field-effect transistors [IGFETs]}

10/464 . . . . {Lateral top-gate IGFETs comprising only a single gate}

10/466 . . . . {Lateral bottom-gate IGFETs comprising only a single gate}

10/468 . . . . {characterised by the gate dielectrics}

10/471 . . . . . {the gate dielectric comprising only organic materials}

10/472 . . . . . {the gate dielectric comprising only inorganic materials}

10/474 . . . . . {the gate dielectric comprising a multilayered structure}

10/476 . . . . . {comprising at least one organic layer and at least one inorganic layer}

10/478 . . . . . {the gate dielectric comprising a layer of composite material comprising interpenetrating or embedded materials, e.g. TiO<sub>2</sub> particles in a polymer matrix}

10/481 . . . . . {characterised by the gate conductors}

10/482 . . . . . {the IGFET comprising multiple separately-addressable gate electrodes}

10/484 . . . . . {characterised by the channel regions}

10/486 . . . . . {the channel region comprising two or more active layers, e.g. forming pn heterojunctions}

10/488 . . . . . {the channel region comprising a layer of composite material having interpenetrating or embedded materials, e.g. a mixture of donor and acceptor moieties, that form a bulk heterojunction}

10/491 . . . . . {Vertical transistors, e.g. vertical carbon nanotube field effect transistors [CNT-FETs]}

10/50 . Bistable switching devices

10/701 . {Organic molecular electronic devices}

10/80 . Constructional details

10/82 . . Electrodes

10/84 . . . Ohmic electrodes, e.g. source or drain electrodes

10/86 . . . Schottky electrodes

10/88 . . Passivation; Containers; Encapsulations

<b>19/00</b>	<b>Integrated devices, or assemblies of multiple devices, comprising at least one organic element specially adapted for rectifying, amplifying, oscillating or switching, covered by group <a href="#">H10K 10/00</a></b>	30/353	• • {comprising blocking layers, e.g. exciton blocking layers}
		30/354	• {comprising a metal-insulator-semiconductor [m-i-s] structure}
		30/40	• comprising a p-i-n structure, e.g. having a perovskite absorber between p-type and n-type charge transport layers
		30/451	• {comprising a metal-semiconductor-metal [m-s-m] structure}
		30/50	• Photovoltaic [PV] devices
		30/53	• • in the form of fibres or tubes, e.g. photovoltaic fibres
		30/57	• • comprising multiple junctions, e.g. tandem PV cells
		30/60	• in which radiation controls flow of current through the devices, e.g. photoresistors
		30/65	• • Light-sensitive field-effect devices, e.g. phototransistors
		30/671	• {Organic radiation-sensitive molecular electronic devices}
		30/80	• Constructional details
		30/81	• • Electrodes
		30/82	• • • Transparent electrodes, e.g. indium tin oxide [ITO] electrodes
		30/821	• • • • {comprising carbon nanotubes}
		30/83	• • • • comprising arrangements for extracting the current from the cell, e.g. metal finger grid systems to reduce the serial resistance of transparent electrodes
		30/84	• • Layers having high charge carrier mobility
		30/85	• • • Layers having high electron mobility, e.g. electron-transporting layers or hole-blocking layers
		30/86	• • • Layers having high hole mobility, e.g. hole-transporting layers or electron-blocking layers
		30/865	• • {Intermediate layers comprising a mixture of materials of the adjoining active layers}
		30/87	• • Light-trapping means
		30/88	• • Passivation; Containers; Encapsulations
		30/89	• • Terminals, e.g. bond pads
		<b>39/00</b>	<b>Integrated devices, or assemblies of multiple devices, comprising at least one organic radiation-sensitive element covered by group <a href="#">H10K 30/00</a></b>
			<b>NOTE</b>
			This group only covers devices that are sensitive to infrared radiation, light, electromagnetic radiation of shorter wavelength or corpuscular radiation.
		39/10	• Organic photovoltaic [PV] modules; Arrays of single organic PV cells
		39/12	• • Electrical configurations of PV cells, e.g. series connections or parallel connections
		39/15	• • comprising both organic PV cells and inorganic PV cells
		39/18	• • Interconnections, e.g. terminals
		39/30	• Devices controlled by radiation
		39/32	• • Organic image sensors
		39/34	• • • integrated with organic light-emitting diodes [OLED]
		39/36	• • Devices specially adapted for detecting X-ray radiation
		39/38	• • Interconnections, e.g. terminals
<b>19/10</b>	• comprising field-effect transistors		
<b>19/20</b>	• comprising components having an active region that includes an inorganic semiconductor		
<b>19/201</b>	• {Integrated devices having a three-dimensional layout, e.g. 3D ICs}		
<b>19/202</b>	• {Integrated devices comprising a common active layer}		
<b>19/80</b>	• Interconnections, e.g. terminals		
<b>19/901</b>	• {Assemblies of multiple devices comprising at least one organic element specially adapted for rectifying, amplifying, oscillating or switching}		
<b>Organic radiation-sensitive devices</b>			
<b>30/00</b>	<b>Organic devices sensitive to infrared radiation, light, electromagnetic radiation of shorter wavelength or corpuscular radiation (integrated devices or assemblies of multiple devices <a href="#">H10K 39/00</a>, <a href="#">H10K 65/00</a>; electrolytic light-sensitive devices <a href="#">H01G 9/20</a>)</b>		
	<b>NOTE</b>		
	This group covers organic semiconductor devices sensitive to radiation insofar as these devices are specially adapted for either:		
	• the conversion of the radiation energy into electrical energy; or		
	• the control of electrical energy by such radiation.		
<b>30/10</b>	• comprising heterojunctions between organic semiconductors and inorganic semiconductors		
<b>30/15</b>	• • Sensitised wide-bandgap semiconductor devices, e.g. dye-sensitised TiO <sub>2</sub> (photo-electrochemical devices comprising a liquid electrolyte or a solid electrolyte <a href="#">H01G 9/20</a> )		
<b>30/151</b>	• • • {the wide bandgap semiconductor comprising titanium oxide, e.g. TiO <sub>2</sub> }		
<b>30/152</b>	• • • {the wide bandgap semiconductor comprising zinc oxide, e.g. ZnO}		
<b>30/20</b>	• comprising organic-organic junctions, e.g. donor-acceptor junctions		
<b>30/211</b>	• • {comprising multiple junctions, e.g. double heterojunctions}		
<b>30/30</b>	• comprising bulk heterojunctions, e.g. interpenetrating networks of donor and acceptor material domains		
<b>30/35</b>	• • comprising inorganic nanostructures, e.g. CdSe nanoparticles		
<b>30/352</b>	• • • {the inorganic nanostructures being nanotubes or nanowires, e.g. CdTe nanotubes in P3HT polymer}		

- 39/401 . {Integrated devices having a three-dimensional layout, e.g. 3D ICs}
- 39/501 . {Integrated devices comprising a common active layer}
- 39/601 . {Assemblies of multiple devices comprising at least one organic radiation-sensitive element}

**WARNING**

Groups [H10K 39/601](#) and [H10K 39/621](#) are incomplete pending reclassification of documents from group [H10W 90/00](#). Groups [H10W 90/00](#), [H10K 39/601](#) and [H10K 39/621](#) should be considered in order to perform a complete search.

- 39/621 . . {comprising only organic radiation-sensitive elements}

**Organic light-emitting devices**

- 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](#))
- 50/10 . OLEDs or polymer light-emitting diodes [PLED]
- 50/11 . . characterised by the electroluminescent [EL] layers
- 50/115 . . . comprising active inorganic nanostructures, e.g. luminescent quantum dots
- 50/12 . . . comprising dopants
- 50/121 . . . . {for assisting energy transfer, e.g. sensitization}
- 50/125 . . . specially adapted for multicolour light emission, e.g. for emitting white light
- 50/13 . . . . comprising stacked EL layers within one EL unit
- 50/131 . . . . . {with spacer layers between the electroluminescent layers}
- 50/135 . . . comprising mobile ions
- 50/14 . . Carrier transporting layers
- 50/15 . . . Hole transporting layers
- 50/155 . . . . comprising dopants
- 50/156 . . . . {comprising a multilayered structure}
- 50/157 . . . . {between the light-emitting layer and the cathode}
- 50/16 . . . Electron transporting layers
- 50/165 . . . . comprising dopants
- 50/166 . . . . {comprising a multilayered structure}
- 50/167 . . . . {between the light-emitting layer and the anode}
- 50/17 . . Carrier injection layers
- 50/171 . . . {Electron injection layers}
- 50/18 . . Carrier blocking layers
- 50/181 . . . {Electron blocking layers}
- 50/182 . . {OLED comprising a fiber structure}
- 50/19 . . Tandem OLEDs
- 50/30 . Organic light-emitting transistors
- 50/401 . {Organic light-emitting molecular electronic devices}
- 50/80 . Constructional details
- 50/805 . . Electrodes
- 50/81 . . . Anodes
- 50/813 . . . . characterised by their shape

- 50/814 . . . . combined with auxiliary electrodes, e.g. ITO layer combined with metal lines
- 50/816 . . . . Multilayers, e.g. transparent multilayers
- 50/818 . . . . Reflective anodes, e.g. ITO combined with thick metallic layers
- 50/82 . . . Cathodes
- 50/822 . . . . characterised by their shape
- 50/824 . . . . combined with auxiliary electrodes
- 50/826 . . . . Multilayers, e.g. opaque multilayers
- 50/828 . . . . Transparent cathodes, e.g. comprising thin metal layers
- 50/84 . . Passivation; Containers; Encapsulations
- 50/841 . . . {Self-supporting sealing arrangements}
- 50/842 . . . Containers
- 50/8423 . . . . {Metallic sealing arrangements}
- 50/8426 . . . . {Peripheral sealing arrangements, e.g. adhesives, sealants}
- 50/8428 . . . . {Vertical spacers, e.g. arranged between the sealing arrangement and the OLED}
- 50/844 . . . Encapsulations
- 50/8445 . . . . {multilayered coatings having a repetitive structure, e.g. having multiple organic-inorganic bilayers}
- 50/846 . . . {comprising getter material or desiccants}
- 50/85 . . Arrangements for extracting light from the devices
- 50/852 . . . comprising a resonant cavity structure, e.g. Bragg reflector pair
- 50/854 . . . comprising scattering means
- 50/856 . . . comprising reflective means
- 50/858 . . . comprising refractive means, e.g. lenses
- 50/86 . . Arrangements for improving contrast, e.g. preventing reflection of ambient light
- 50/865 . . . {comprising light absorbing layers, e.g. light-blocking layers}
- 50/868 . . {Arrangements for polarized light emission ([H10K 50/86](#) takes precedence)}
- 50/87 . . Arrangements for heating or cooling
- 50/88 . . Terminals, e.g. bond pads
- 59/00** **Integrated devices, or assemblies of multiple devices, comprising at least one organic light-emitting element covered by group [H10K 50/00](#)**
- 59/10 . OLED displays
- 59/12 . . Active-matrix OLED [AMOLED] displays
- 59/1201 . . . {Manufacture or treatment}
- 59/121 . . . characterised by the geometry or disposition of pixel elements
- 59/1213 . . . . {the pixel elements being TFTs}
- 59/1216 . . . . {the pixel elements being capacitors}
- 59/122 . . . Pixel-defining structures or layers, e.g. banks
- 59/123 . . . Connection of the pixel electrodes to the thin film transistors [TFT]
- 59/124 . . . Insulating layers formed between TFT elements and OLED elements
- 59/125 . . . including organic TFTs [OTFT]
- 59/126 . . . Shielding, e.g. light-blocking means over the TFTs
- 59/127 . . . comprising two substrates, e.g. display comprising OLED array and TFT driving circuitry on different substrates
- 59/1275 . . . . {Electrical connections of the two substrates}

- 59/128 . . . comprising two independent displays, e.g. for emitting information from two major sides of the display
  - 59/129 . . . Chiplets
  - 59/13 . . . comprising photosensors that control luminance
  - 59/131 . . . Interconnections, e.g. wiring lines or terminals
  - 59/1315 . . . . {comprising structures specially adapted for lowering the resistance}
  - 59/17 . . Passive-matrix OLED displays
  - 59/173 . . . comprising banks or shadow masks
  - 59/176 . . . comprising two independent displays, e.g. for emitting information from two major sides of the display
  - 59/179 . . . Interconnections, e.g. wiring lines or terminals
  - 59/1795 . . . . {comprising structures specially adapted for lowering the resistance}
  - 59/18 . . Tiled displays
  - 59/19 . . Segment displays
  - 59/221 . . {Static displays, e.g. displaying permanent logos}
  - 59/30 . Devices specially adapted for multicolour light emission
  - 59/32 . . Stacked devices having two or more layers, each emitting at different wavelengths
  - 59/35 . . comprising red-green-blue [RGB] subpixels
  - 59/351 . . . {comprising more than three subpixels, e.g. red-green-blue-white [RGBW]}
  - 59/352 . . . {the areas of the RGB subpixels being different}
  - 59/353 . . . {characterised by the geometrical arrangement of the RGB subpixels}
  - 59/38 . . comprising colour filters or colour changing media [CCM]
  - 59/40 . OLEDs integrated with touch screens
  - 59/50 . OLEDs integrated with light modulating elements, e.g. with electrochromic elements, photochromic elements or liquid crystal elements
  - 59/60 . OLEDs integrated with inorganic light-sensitive elements, e.g. with inorganic solar cells or inorganic photodiodes
  - 59/65 . . OLEDs integrated with inorganic image sensors
  - 59/70 . OLEDs integrated with inorganic light-emitting elements, e.g. with inorganic electroluminescent elements
  - 59/751 . {Integrated devices having a three-dimensional layout, e.g. 3D ICs}
  - 59/771 . {Integrated devices comprising a common active layer}
  - 59/80 . Constructional details
  - 59/805 . . {Electrodes}
  - 59/8051 . . . {Anodes}
  - 59/80515 . . . . {characterised by their shape}
  - 59/80516 . . . . {combined with auxiliary electrodes, e.g. ITO layer combined with metal lines}
  - 59/80517 . . . . {Multilayers, e.g. transparent multilayers}
  - 59/80518 . . . . {Reflective anodes, e.g. ITO combined with thick metallic layers}
  - 59/8052 . . . {Cathodes}
  - 59/80521 . . . . {characterised by their shape}
  - 59/80522 . . . . {combined with auxiliary electrodes}
  - 59/80523 . . . . {Multilayers, e.g. opaque multilayers}
  - 59/80524 . . . . {Transparent cathodes, e.g. comprising thin metal layers}
  - 59/82 . . Interconnections, e.g. terminals ([H10K 59/131](#), [H10K 59/179](#) take precedence)
  - 59/84 . . Parallel electrical configurations of multiple OLEDs
  - 59/86 . . Series electrical configurations of multiple OLEDs
  - 59/87 . . {Passivation; Containers; Encapsulations}
  - 59/871 . . . {Self-supporting sealing arrangements}
  - 59/872 . . . . {Containers}
  - 59/8721 . . . . {Metallic sealing arrangements}
  - 59/8722 . . . . {Peripheral sealing arrangements, e.g. adhesives, sealants}
  - 59/8723 . . . . {Vertical spacers, e.g. arranged between the sealing arrangement and the OLED}
  - 59/873 . . . {Encapsulations}
  - 59/8731 . . . . {multilayered coatings having a repetitive structure, e.g. having multiple organic-inorganic bilayers}
  - 59/874 . . . {including getter material or desiccant}
  - 59/875 . . {Arrangements for extracting light from the devices}
  - 59/876 . . . {comprising a resonant cavity structure, e.g. Bragg reflector pair}
  - 59/877 . . . {comprising scattering means}
  - 59/878 . . . {comprising reflective means}
  - 59/879 . . . {comprising refractive means, e.g. lenses}
  - 59/8791 . . {Arrangements for improving contrast, e.g. preventing reflection of ambient light}
  - 59/8792 . . . {comprising light absorbing layers, e.g. black layers}
  - 59/8793 . . {Arrangements for polarized light emission ([H10K 59/8791](#) takes precedence)}
  - 59/8794 . . {Arrangements for heating and cooling}
  - 59/88 . . Dummy elements, i.e. elements having non-functional features
  - 59/90 . Assemblies of multiple devices comprising at least one organic light-emitting element
- WARNING**
- Groups [H10K 59/90](#) and [H10K 59/95](#) are incomplete pending reclassification of documents from group [H10W 90/00](#). Groups [H10W 90/00](#), [H10K 59/90](#) and [H10K 59/95](#) should be considered in order to perform a complete search.
- 59/95 . . wherein all light-emitting elements are organic, e.g. assembled OLED displays
- 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](#))**
- WARNING**
- Group [H10K 65/00](#) is incomplete pending reclassification of documents from group [H10W 90/00](#). Groups [H10W 90/00](#) and [H10K 65/00](#) should be considered in order to perform a complete search.



**Manufacture or treatment; Constructional details**

- 71/00 Manufacture or treatment specially adapted for the organic devices covered by this subclass**
- 71/10 . Deposition of organic active material
  - 71/12 . . using liquid deposition, e.g. spin coating
  - 71/125 . . . {using electrolytic deposition e.g. in-situ electropolymerisation}
  - 71/13 . . . using printing techniques, e.g. ink-jet printing or screen printing
  - 71/135 . . . . {using ink-jet printing}
  - 71/15 . . . characterised by the solvent used
  - 71/16 . . using physical vapour deposition [PVD], e.g. vacuum deposition or sputtering
  - 71/162 . . . {using laser ablation}
  - 71/164 . . . {using vacuum deposition}
  - 71/166 . . . {using selective deposition, e.g. using a mask}
  - 71/18 . . using non-liquid printing techniques, e.g. thermal transfer printing from a donor sheet
  - 71/191 . . {characterised by provisions for the orientation or alignment of the layer to be deposited}
  - 71/20 . Changing the shape of the active layer in the devices, e.g. patterning
  - 71/211 . . {by selective transformation of an existing layer}
  - 71/221 . . {by lift-off techniques}
  - 71/231 . . {by etching of existing layers}
  - 71/233 . . . {by photolithographic etching}
  - 71/236 . . . {using printing techniques, e.g. applying the etch liquid using an ink jet printer}
  - 71/30 . Doping active layers, e.g. electron transporting layers
  - 71/311 . {Purifying organic semiconductor materials}
  - 71/40 . Thermal treatment, e.g. annealing in the presence of a solvent vapour
  - 71/421 . . {using coherent electromagnetic radiation, e.g. laser annealing}
  - 71/441 . . {in the presence of solvent vapors, e.g. solvent vapour annealing}
  - 71/50 . Forming devices by joining two substrates together, e.g. lamination techniques
  - 71/60 . Forming conductive regions or layers, e.g. electrodes
  - 71/611 . . {using printing deposition, e.g. ink jet printing}
  - 71/621 . {Providing a shape to conductive layers, e.g. patterning or selective deposition}
  - 71/70 . Testing, e.g. accelerated lifetime tests
  - 71/80 . using temporary substrates
  - 71/811 . {Controlling the atmosphere during processing (H10K 71/40 takes precedence)}
  - 71/821 . {Patterning of a layer by embossing, e.g. stamping to form trenches in an insulating layer}
  - 71/831 . {Aging}
  - 71/841 . {Applying alternating current [AC] during manufacturing or treatment}
  - 71/851 . {Division of substrate}
  - 71/861 . {Repairing}

**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**

    - 77/10 . Substrates, e.g. flexible substrates
    - 77/111 . . {Flexible substrates}

**85/00****Organic materials used in the body or electrodes of devices covered by this subclass****NOTE**

This group only covers organic materials for their electrical or other properties, insofar as they are specially adapted for the devices covered by this subclass.

- 85/10 . Organic polymers or oligomers
- 85/111 . . {comprising aromatic, heteroaromatic, or aryl chains, e.g. polyaniline, polyphenylene or polyphenylene vinylene}
- 85/113 . . . {Heteroaromatic compounds comprising sulfur or selen, e.g. polythiophene}
- 85/1135 . . . . {Polyethylene dioxythiophene [PEDOT]; Derivatives thereof}
- 85/114 . . . {Poly-phenylenevinylene; Derivatives thereof}
- 85/115 . . . {Polyfluorene; Derivatives thereof}
- 85/141 . . {comprising aliphatic or olefinic chains, e.g. poly N-vinylcarbazol, PVC or PTFE}
- 85/143 . . . {Polyacetylene; Derivatives thereof}
- 85/146 . . . {poly N-vinylcarbazol; Derivatives thereof}
- 85/151 . . {Copolymers}
- 85/154 . . {Ladder-type polymers}
- 85/20 . Carbon compounds, e.g. carbon nanotubes or fullerenes
- 85/211 . . {Fullerenes, e.g. C<sub>60</sub>}
- 85/215 . . . {comprising substituents, e.g. PCBM}
- 85/221 . . {Carbon nanotubes}
- 85/225 . . . {comprising substituents}
- 85/30 . Coordination compounds
- 85/311 . . {Phthalocyanine}
- 85/321 . . {Metal complexes comprising a group IIIA element, e.g. Tris (8-hydroxyquinoline) gallium [Ga<sub>q</sub>3]}
- 85/322 . . . {comprising boron}
- 85/324 . . . {comprising aluminium, e.g. Al<sub>q</sub>3}
- 85/326 . . . {comprising gallium}
- 85/331 . . {Metal complexes comprising an iron-series metal, e.g. Fe, Co, Ni}
- 85/341 . . {Transition metal complexes, e.g. Ru(II)polypyridine complexes (H10K 85/331 takes precedence)}
- 85/342 . . . {comprising iridium}
- 85/344 . . . {comprising ruthenium}
- 85/346 . . . {comprising platinum}
- 85/348 . . . {comprising osmium}
- 85/351 . . {Metal complexes comprising lanthanides or actinides, e.g. comprising europium}
- 85/361 . . {Polynuclear complexes, i.e. complexes comprising two or more metal centers}
- 85/371 . . {Metal complexes comprising a group IB metal element, e.g. comprising copper, gold or silver}
- 85/381 . . {Metal complexes comprising a group IIB metal element, e.g. comprising cadmium, mercury or zinc}
- 85/40 . Organosilicon compounds, e.g. TIPS pentacene
- 85/50 . Organic perovskites; Hybrid organic-inorganic perovskites [HOIP], e.g. CH<sub>3</sub>NH<sub>3</sub>PbI<sub>3</sub>
- 85/60 . Organic compounds having low molecular weight (H10K 85/10 - H10K 85/50 take precedence)
- 85/611 . . {Charge transfer complexes}

- 85/615 . . {Polycyclic condensed aromatic hydrocarbons, e.g. anthracene}
- 85/621 . . . {Aromatic anhydride or imide compounds, e.g. perylene tetra-carboxylic dianhydride or perylene tetracarboxylic di-imide}
- 85/622 . . . {containing four rings, e.g. pyrene}
- 85/623 . . . {containing five rings, e.g. pentacene}
- 85/624 . . . {containing six or more rings}
- 85/625 . . . {containing at least one aromatic ring having 7 or more carbon atoms, e.g. azulene}
- 85/626 . . . {containing more than one polycyclic condensed aromatic rings, e.g. bis-anthracene}
- 85/631 . . {Amine compounds having at least two aryl rest on at least one amine-nitrogen atom, e.g. triphenylamine}
- 85/633 . . . {comprising polycyclic condensed aromatic hydrocarbons as substituents on the nitrogen atom}
- 85/636 . . . {comprising heteroaromatic hydrocarbons as substituents on the nitrogen atom}
- 85/649 . . {Aromatic compounds comprising a hetero atom}
- 85/652 . . . {Cyanine dyes}
- 85/653 . . . {comprising only oxygen as heteroatom}
- 85/654 . . . {comprising only nitrogen as heteroatom (H10K 85/652 takes precedence)}
- 85/655 . . . {comprising only sulfur as heteroatom}
- 85/656 . . . {comprising two or more different heteroatoms per ring (H10K 85/652 takes precedence)}
- 85/6565 . . . . {Oxadiazole compounds}
- 85/657 . . . {Polycyclic condensed heteroaromatic hydrocarbons}
- 85/6572 . . . . {comprising only nitrogen in the heteroaromatic polycondensed ring system, e.g. phenanthroline or carbazole}
- 85/6574 . . . . {comprising only oxygen in the heteroaromatic polycondensed ring system, e.g. cumarine dyes}
- 85/6576 . . . . {comprising only sulfur in the heteroaromatic polycondensed ring system, e.g. benzothiophene}
- 85/658 . . {Organoboranes}
- 85/701 . {Langmuir Blodgett films}
- 85/731 . {Liquid crystalline materials}
- 85/761 . {Biomolecules or bio-macromolecules, e.g. proteins, chlorophyll, lipids or enzymes}
- 85/791 . {Starburst compounds}

- 2101/40 . Interrelation of parameters between multiple constituent active layers or sublayers, e.g. HOMO values in adjacent layers
- 2101/50 . Oxidation-reduction potentials, e.g. excited state redox potentials
- 2101/60 . Up-conversion, e.g. by triplet-triplet annihilation
- 2101/70 . Down-conversion, e.g. by singlet fission
- 2101/80 . {Composition varying spatially, e.g. having a spatial gradient}
- 2101/90 . {Multiple hosts in the emissive layer}

**Indexing scheme associated with groups H10K 10/80, H10K 30/80, H10K 50/80, H10K 59/80 and H10K 77/00, relating to constructional details**

- 2102/00 Constructional details relating to the organic devices covered by this subclass**
- 2102/10 . Transparent electrodes, e.g. using graphene
- 2102/101 . . {comprising transparent conductive oxides [TCO]}
- 2102/102 . . . {comprising tin oxides, e.g. fluorine-doped SnO<sub>2</sub>}
- 2102/103 . . . {comprising indium oxides, e.g. ITO}
- 2102/20 . Metallic electrodes, e.g. using a stack of layers
- 2102/301 . {Details of OLEDs}
- 2102/302 . . {of OLED structures}
- 2102/3023 . . . {Direction of light emission}
- 2102/3026 . . . . {Top emission}
- 2102/3031 . . . . {Two-side emission, e.g. transparent OLEDs [TOLED]}
- 2102/3035 . . . . {Edge emission}
- 2102/311 . . {Flexible OLED}
- 2102/321 . . {Inverted OLED, i.e. having cathode between substrate and anode}
- 2102/331 . . {Nanoparticles used in non-emissive layers, e.g. in packaging layer}
- 2102/341 . . {Short-circuit prevention}
- 2102/351 . . {Thickness}
- 2102/361 . . {Temperature}

**99/00 Subject matter not provided for in other groups of this subclass**

**Indexing scheme associated with group H10K 85/00, relating to properties of organic materials**

- 2101/00 Properties of the organic materials covered by group H10K 85/00**
- 2101/10 . Triplet emission
- 2101/20 . Delayed fluorescence emission
- 2101/25 . . using exciplex
- 2101/27 . {Combination of fluorescent and phosphorescent emission}
- 2101/30 . Highest occupied molecular orbital [HOMO], lowest unoccupied molecular orbital [LUMO] or Fermi energy values