- generation of an object from the material composition.

[0010] The material composition may consist of the photo-alignable material alone or it may comprise additional substances. Preferably, the material composition comprises at least one photo-alignable material and at least one additional substance, wherein the materials are so selected that in an object prepared from the composition phase separation can occur, such that the concentration of at least one sort of photo-alignable material is higher at least at one surface of the object than in the bulk of the object.

[0011] An object in the meaning of this application can have any form or shape. For example, it may be a body with complex surfaces. In a preferred embodiment, the object is a flexible foil. In another preferred embodiment, the object comprises topographical surface structures, such as microstructures like micro lenses or micro-prisms, or structures exhibiting abrupt changes of the shape, such as rectangular structures.

[0012] The object may be generated by any suitable method like, extruding, casting, molding, 2D- or 3D-printing or coating.

[0012a] In one aspect of the present disclosure, there is provided a method for the production of a photo-alignable object comprising the steps
- providing a material composition comprising a photo-alignable material
- generation of a photo-alignable object from the material composition, wherein the photo-alignable object is a free standing film with a thickness larger than 500 nm.

[0012b] In another aspect of the present disclosure, there is provided a photo-alignable object manufactured according to the method as described herein.

[0012c] In yet another aspect of the present disclosure, there is provided a photo-alignable object, which has a thickness of more than 2µm.

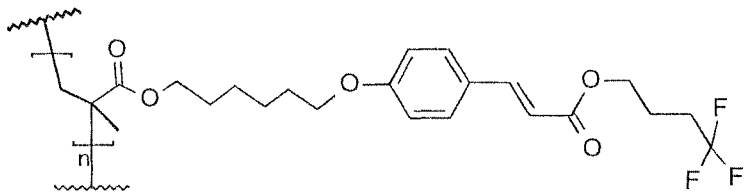
[0012d] In another aspect of the present disclosure, there is provided a photo-alignable object, which is in the form of a free standing flim.

[0012e] In a further aspect of the present disclosure, there is provided a photo-aligned object, manufactured by exposing an object as described herein to aligning light.

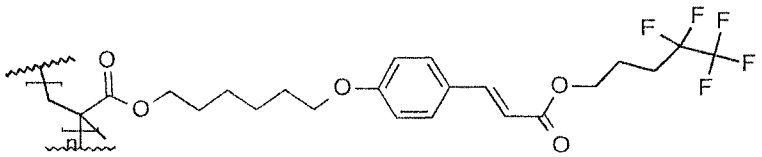
[0012f] In another aspect of the present disclosure, there is provided a device containing a slave material, which has been aligned by a photo-aligned object as described herein.

[0012g] In yet another aspect of the present disclosure, there is provided an autostereoscopic 3D display comprising a device as described herein.

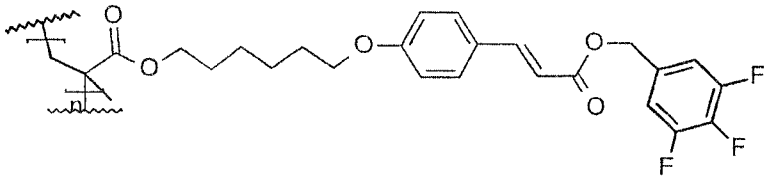
[0012h] In a further aspect of the present disclosure, there is a provided a photo-alignable material according to any of the polymer structures (i), (ii) or (iii) below or the co-polymer (iv) of 6-[4-[(E)-3-oxo-3-(4,4,4-trifluorobutoxy)prop-1-enyl]phenoxy]hexyl 2-methylprop-2-enoate and 6-[4-[(E)-3-methoxy-3-oxo-prop-1-enyl]phenoxy]hexyl 2-methylprop- 2-enoate:



(i)



(ii)



(iii)

[0012i] In another aspect of the present disclosure, there is provided a material composition comprising a photo-alignable material of any of the substances (i), (ii), (iii) or (iv) as defined herein and another substance, which does not comprise photo-alignable moieties.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] The invention is further illustrated by the accompanying drawing figures. It is emphasized that the various features are not necessarily drawn to scale.

[0014] Fig. 1 depicts an example of the state of the art photo-alignment technique, where a thin photo-alignment layer is applied to a support.

[0015] Fig. 2 shows an application, in which a photo-alignable object with a surface structure has been used to align a slave material on top.

[0016] Fig. 3 shows a cell, wherein a liquid crystal is aligned by two photo-aligned objects.

[0017] Fig. 4 illustrates an example of generating a photo-alignable object with surface structures.

[0018] Fig. 5 illustrates a method of generating a photo-alignable object with surface structures by imprinting.

CLAIMS

1. Method for the production of a photo-alignable object comprising the steps
- providing a material composition comprising a photo-alignable material
- generation of a photo-alignable object from the material composition, wherein the photo-alignable object is a free standing film with a thickness larger than 500 nm.

2. Method according to claim 1, wherein the material composition comprises a photo-alignable material and another substance, which does not comprise photo-alignable moieties.

3. Method according to claim 2, wherein the percentage by weight of the sum of the photo-alignable materials in the composition is less than 50%.

4. Method according to any of claims 2 or 3, wherein the photo-alignable material and the other substance are phase separated.

5. Method according to any of claims 1 to 4, wherein the photo-alignable material comprises fluorinated moieties.

6. Method according to any preceding claim, wherein the object is generated on a support and in a subsequent step the object is removed from the support.

7. Method according to claim 6, wherein the support has a topographical surface structure.

8. Method according to any of claims 6 or 7, wherein the support is moving during generation of the object.

9. Method according to any of claims 6 to 8, wherein the support is a mold which provides a surface structure and the material composition comprising a photo-alignable material is casted to the mold and in a later step the generated photo-alignable object is removed from the mold.

10. Method according to any of claims 7 to 9, wherein the topographical surface structure comprises microelements.

11. Method according to any of claims 7 to 10, wherein the depth of the topographical surface structure is larger than 100 nm.

12. Method according to any of claims 1 to 5, wherein the photo-alignable object in the form of a free standing film is prepared by extrusion.

13. Method according to any preceding claim, wherein surface structures are created in the photo-alignable object, either during or after preparation of the object, by embossing with an embossing tool.

14. Method according to any preceding claim, wherein the photo-alignable object is subsequently exposed to aligning light.

15. Method according to claim 14, wherein a slave material is applied on at least part of the photo-aligned object.

16. Method according to claim 15, wherein the object has a topographical surface structure and the structure of the surface is transferred into the slave material.

17. Method according to any of claims 15 or 16, wherein the slave material is an LCP material.

18. Photo-alignable object manufactured according to any of claims 1 to 17.

19. Photo-alignable object, which has a thickness of more than 2µm.

20. Photo-alignable object, which is in the form of a free standing film.

21. Photo-alignable object according to any of claims 18 to 20, which has a topographical surface structure.

22. Photo-alignable object according to claim 21, wherein the depth of the topographical surface structure is larger than 100nm.

23. Photo-alignable object according to claim 21 or 22, wherein the surface structure comprises microelements.

24. Photo-aligned object, manufactured by exposing an object according to any of claims 18 to 23 to aligning light.

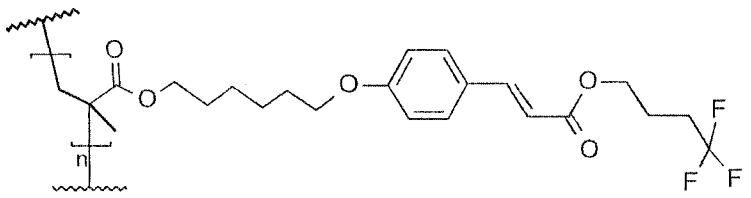
25. Device containing a slave material, which has been aligned by a photo-aligned object according to claim 24.

26. Device according to claim 25, wherein the slave material has at least one surface which is topographically structured and is or was in contact with the photo-aligned object.

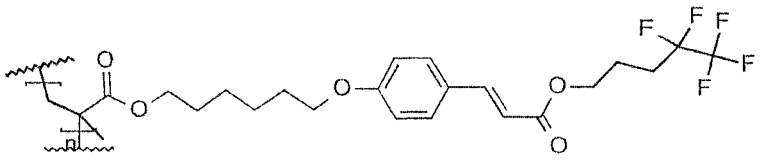
27. Device according to claim 26, wherein the slave material has the function of anisotropic lenses.

28. Autostereoscopic 3D display comprising a device according to any of claims 25 to 27.

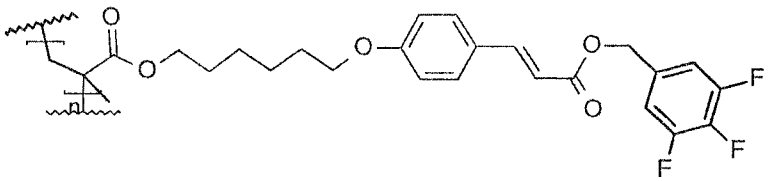
29. Photo-alignable material according to any of the polymer structures (i), (ii) or (iii) below or the co-polymer (iv) of 6-[4-[(E)-3-oxo-3-(4,4,4-trifluorobutoxy)prop-1-enyl]phenoxy]hexyl 2-methylprop-2-enoate and 6-[4-[(E)-3-methoxy-3-oxo-prop-1-enyl]phenoxy]hexyl 2-methylprop-2-enoate:



(i)



(ii)



(iii)

30. Material composition comprising a photo-alignable material of any of the substances (i), (ii), (iii) or (iv) according to claim 29 and another substance, which does not comprise photo-alignable moieties.