A. Segalman, H. Yokoyama, and E. J. Kramer, Adv. Matter. 13, 1152 (2003); R. A. Segalman, H. Yokoyama, and E. J. Kramer, Adv. Matter. 13, 1152 (2003)]. To determine the topological defects, the combined Voronoï diagrams and/or the Delaunay triangulations are conventionally used. After binarization of the image, the centre of each domain is identified. The Delaunay triangulation and/or the Voronoï diagram then makes it possible to identify the number of first order neighbours while the function of distribution of the distance to the nearest neighbour of the domain centres makes it possible to quantify the mean deviation between two nearest neighbours. It is thus possible to quantify the number of defects. This method of counting is described in the article by Tiron et al. (J. Vac. Sci. Technol. B 29(6), 1071-1023, 2011).

Summary ~~of the invention~~.

The ~~invention~~ disclosure relates to a process for the preparation, by spatial distribution of light intensity, of a surface in relief promoting order and spatial coherence serving as a guide for the organization, on nano- and micrometre scales, of an overlayer on the surface comprising the following steps:

A: Deposition of a solution or dispersion of at least one (co)-polymer containing at least one isomerizable functional group on a surface.

B: Evaporation of the solvent.

C: Irradiation of the surface thus treated according to a spatial distribution of light intensity and creation of motifs possessing a periodic or non-periodic relief.

D: Deposition of a solution or a dispersion on the surface thus treated, of at least one nano-object, consisting of an assembly of atoms, of which at least one of the three dimensions is less than the half-wavelength used for the irradiation of the surface.

E: Removal of the solvent by evaporation or reaction.

In a first aspect, there is provided a process for the preparation, by spatial distribution of light intensity, of a surface in relief promoting order and spatial coherence serving as a guide for the organization, on nano- and micrometre scales, of an overlayer on the surface comprising the following steps:

A: Deposition of a solution or dispersion of at least one (co)-polymer containing at least one isomerizable functional group on a surface.

B: Evaporation of the solvent.

C: Irradiation of the surface thus treated according to a spatial distribution of light intensity and creation of motifs possessing a periodic or non-periodic relief.

D: Deposition of a solution or a dispersion on the surface thus treated, of at least one block copolymer, of which at least one of the three dimensions is less than the half-wavelength used for the irradiation of the surface.

E: Removal of the solvent by evaporation or reaction.

In a second aspect, there is provided a surface obtained according to a process as defined above.

In a third aspect, there is provided the use of a surface as defined above, for the manufacture of surfaces useful in applications for holographic optical components, for the volume storage of data, for the production of surfaces or materials exhibiting photo-controlled deformation, for the creation of nanoporous or microporous structures, for example, for filtration membranes or for batteries, for surface coating in order to obtain, for example, super-hydrophobic surfaces, variegated surfaces, antireflective surfaces, surfaces exhibiting an opalescent effect, for the creation of optical or Plasmon waveguides on substrates, for the control of the transport properties of materials (electronic, acoustic, thermal, electromagnetic and the like), for the production of templates on the nanometre scale, or as assembly guide for block copolymers on a surface serving in particular as lithography mask.

Detailed description.

The expression nano-object is understood to mean an assembly of atoms, of which at least one of the three dimensions is less than the half-wavelength used for the irradiation of the surface. This may consist of particles, which may be organic, inorganic or organic/inorganic hybrids. The inorganic particles may be magnetic particles such as iron-platinum particles. The organic particles may be liquid crystal molecules, or molecules crystallizing by surface epitaxy, but also (co)-polymer core-shell structures, polymer or nonpolymer vesicles, (co)-polymer or non-(co)-polymer micelles. The expression nano-object is also understood to mean (co)-polymers capable of becoming organized, such as liquid crystal (co)-polymers, (co)-polymers capable of becoming organized by crystallizing

periodically, block copolymers capable of self-organizing. Preferably, the nano-objects are block copolymers. The expression dimension is understood to mean the size corresponding to the step of organization of the nano-object into domains, when this consists for example of block copolymers. A precise definition of nano-objects is also given by the ISO/TS 27687 standard: 2008: 2008-08.

The (co)-polymers containing isomerizable bonds and, where appropriate, crosslinkable functional groups used in the