

etching contrast, and also the production of porous membranes or else as catalyst support.

5 Summary:

There is provided a nanostructured assembly process using a composition comprising a block copolymer, at least one of the blocks of which is crystallizable or has at least one liquid crystal phase, and comprising the following steps:

10

- dissolving the block copolymer in a solvent,
- depositing this solution on a surface,
- annealing.

15 In an aspect, there is provided a nanostructured assembly process using a composition comprising a block copolymer, at least one of the blocks of which is crystallizable or has at least one liquid crystal phase, wherein the at least one of the blocks is selected such that the Flory-Huggins
20 parameter χ of the block copolymer is between 0.01 and 100, and comprising the following steps:

- dissolving the block copolymer in a solvent,
 - depositing this solution on a surface selected from the
25 group consisting of silicon, silicon having a native or thermal oxide layer, hydrogenated or halogenated silicon, germanium, hydrogenated or halogenated germanium, platinum and platinum oxide, tungsten and oxides, gold, titanium nitrides and graphenes,
- 30 - annealing.

In another aspect, there is provided the use of the process as defined above, in the field of lithography, or more generally in the field of surface nanostructuring for electronics.

5

In another aspect, there is provided a mask of block copolymer obtained by the process as defined above.

Detailed description:

10

The term "surface" is understood to mean a surface which can be flat or non-flat.

The term "annealing" is understood to mean a step of
15 heating at a certain temperature that enables the evaporation of the solvent, when it is present, and that allows the establishment of the desired nanostructuring in a given time (self-assembly). The term "annealing" is also understood to mean the establishment of the nanostructuring
20 of the block copolymer film when said film is subjected to a controlled atmosphere of one or more solvent vapors, these vapors giving the polymer chains sufficient mobility to become organized by themselves on the surface. The term "annealing" is also understood to mean any combination of
25 the abovementioned two methods.

Claims

1 A nanostructured assembly process using a composition
5 comprising a block copolymer, at least one of the blocks of
which is crystallizable or has at least one liquid crystal
phase, wherein the at least one of the blocks is selected
such that the Flory-Huggins parameter χ of the block
copolymer is between 0.01 and 100, and comprising the
10 following steps:

- dissolving the block copolymer in a solvent,
- depositing this solution on a surface selected from the
group consisting of silicon, silicon having a native or
15 thermal oxide layer, hydrogenated or halogenated silicon,
germanium, hydrogenated or halogenated germanium, platinum
and platinum oxide, tungsten and oxides, gold, titanium
nitrides and graphenes,
- annealing.

20

2 The process as claimed in claim 1, wherein the block
copolymer is a diblock copolymer.

3 The process as claimed in claim 1, wherein the block
25 copolymer has a crystallizable block.

4 The process as claimed in claim 1, wherein the block
which has a liquid crystal phase is lyotropic.

30 5 The process as claimed in claim 1, wherein the block
which has a liquid crystal phase is thermotropic.

- 6 The process as claimed in claim 1, wherein the orientation of the block copolymer is carried out during a time of between 1 and 20 minutes, limits included.
- 5 7 The process as claimed in claim 1, wherein the orientation of the block copolymer is carried out at a temperature of between 333 K and 603 K.