10 nm, at low temperatures (between 333 K and 603 K, and preferably between 373 K and 603 K).

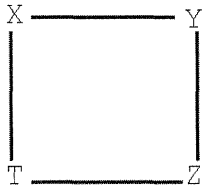
- The presence of entities resulting from monomers of the family of (I) silicon or germanium carbide precursors after plasma treatment or treatment by pyrolysis that makes it possible to obtain hard masks during the mask etching step.

- The orientation of the domains during the self-assembly of such block copolymers does not require preparation of the support (no neutralization layer), the orientation of the domains being governed by the thickness of the block copolymer film deposited.

Thus, these materials show a very great advantage for applications in nanolithography for the production of etching masks of very small dimensions and that have a good etching contrast, and also the production of porous membranes or else as catalyst support.

Summary ~~of the invention~~:

~~The invention relates to~~ 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 consists of at least one monomer corresponding to the following formula (I):

I= 

where X= $Si(R_1,R_2)$; $Ge(R_1,R_2)$

Z= $Si(R_3,R_4)$; $Ge(R_3,R_4)$; O; S; $C(R_3,R_4)$

Y= O; S; $C(R_5,R_6)$

T= O; S; $C(R_7,R_8)$

with R_1= R_2 and R_3 = R_4 and R_5 = R_6 and R_7 = R_8 are selected from hydrogen, linear, branched or cyclic alkyl groups, with or without heteroatoms, and aromatic groups with or without heteroatoms and comprising the following steps:

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

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

Detailed description:

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 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 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 the abovementioned two methods.

Any block copolymer, whatever its associated morphology, will be able to be used in the context of the invention,