CLAIMS

1. Surface preparation method using molecules comprising at least one covalent bond which gives rise to free radicals when the molecule is activated thermally, by organic or inorganic reduction-oxidation, photochemically, by shear, by plasma, or else under the influence of ionizing radiation, said method comprising the following steps:

- contacting the molecules with the surface to be treated,
- activating the covalent bond which gives rise to free radicals thermally, by organic or inorganic reduction-oxidation, photochemically, by shear, by plasma, or else under the influence of ionizing radiation, to form a film that is grafted over the surface with a thickness of less than 10 nm on the surface,
- evaporating, when present, the solubilisation or dispersion solvent employed for contacting the molecules with the surface to be treated, wherein the molecule is a copolymer and the copolymer is a gradient copolymer.

2. Method according to Claim 1, wherein the covalent bonds which give rise to free radicals have a bond energy of between 90 and 270 kJ/mol.

3. Method according to Claim 1, wherein the covalent bonds which give rise to free radicals have a bond energy of between 100 and 170 kJ/mol.

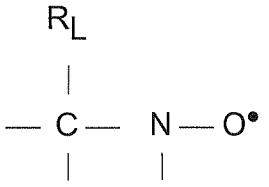
4. Method according to Claim 1, wherein the copolymer has a molecular mass of more than 500 g/mol.

5. Method according to Claim 1, wherein the copolymer has a molecular mass of between 1000 and 20 000 g/mol.

6. Method according to Claim 1, wherein the copolymer is prepared by controlled radical polymerization.

7. Method according to Claim 1, wherein the copolymer is prepared by nitroxide-controlled radical polymerization.

8. Method according to Claim 7, wherein the nitroxides conform to the formula below:



(1)

in which the radical R_L has a molar mass of more than 15.0342.

9. Method according to Claim 8, wherein the following nitroxides are preferred:

- N-tert-butyl 1-phenyl-2-methylpropyl nitroxide,
- N-tert-butyl 1-(2-naphthyl)-2-methylpropyl nitroxide,
- N-tert-butyl 1-diethylphosphono-2,2-dimethylpropyl nitroxide,
- N-tert-butyl 1-dibenzylphosphono-2,2-dimethylpropyl nitroxide,
- N-phenyl 1-diethylphosphono-2,2-dimethylpropyl nitroxide,
- N-phenyl 1-diethylphosphono-1-methylethyl nitroxide,
- N-(1-phenyl-2-methylpropyl) 1-diethylphosphono-1-methylethyl nitroxide,
- 4-oxo-2,2,6,6-tetramethyl-1-piperidinyloxy,
- 2,4,6-tri-tert-butylphenoxy.

10. Method according to Claim 9, wherein the nitroxide is N-tert-butyl 1-diethylphosphono-2,2-dimethylpropyl nitroxide.

11. Method according to any of Claims 1 to 10, wherein the surface is mineral.

12. Method according to any of Claims 1 to 10, wherein the surface is metallic.

13. Method according to Claim 11, wherein the surface is of silicon.

14. Method according to Claim 12, wherein the surface is gold.

15. Use of the method according to any of Claims 1 to 9 for controlling the structuring of block copolymers, enhancing the printability of inks or paint, the wettability, the weathering or ageing resistance, the adhesion, the biocompatibility, the prevention of migration of inks, the prevention of deposits of proteins, of soiling or of moulds.