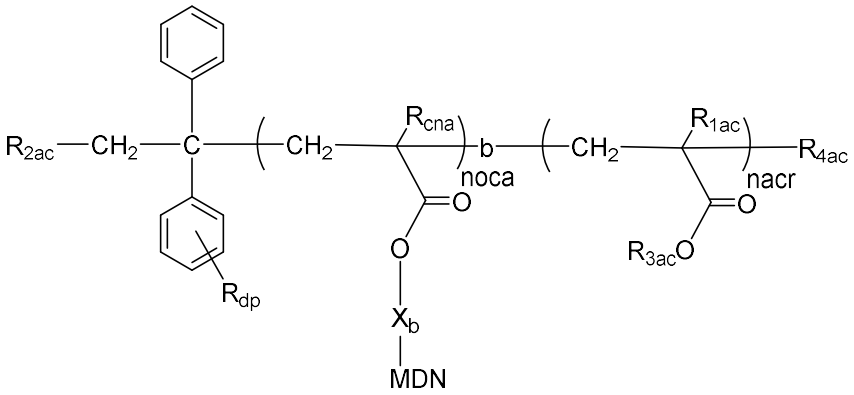
a C-1 to C-8 linear alkylene,

a C-3 to C-8 branched alkylene,

a C-3 to C-8 cyclic alkylene and

a -X_{1a}-O-X_{2a}- (-alkyleneoxyalkylene-) moiety wherein X_{1a} and X_{2a} are independently selected from a C-1 to C-8 linear alkylene, a C-3 to C-8 branched alkylene and a C-3 to C-8 cyclic alkylene; and

MDN is an azide moiety (-N_3), or a cyano moiety (-CN);



(VVI).

21. A composition comprising the functional polymer of any one of claims 1 to 20, and a spin casting solvent.

22. A process of coating a pinning layer comprising the step of

i) coating the compositions of claim 21 on a substrate which contains only metallic surfaces, or which contains a mixture of metallic and non-metallic surfaces forming a coating on said substrate.

23. The process of claim 22 wherein said substrate is one which contains both metallic and non-metallic surfaces selected from the group consisting of

a substrate having metallic surfaces and Si surfaces,

a substrate having metallic surfaces and GaAs surfaces,

a substrate having metallic surfaces and Ge surfaces,

a substrate having metallic and silicon oxide surfaces,

a substrate having metallic and silicon nitride surfaces,

a substrate having metallic and silicon oxynitride surfaces,

a substrate having metallic and neutral layer surfaces,

a substrate having metallic and photoresist surfaces, and

a substrate having metallic and spin on carbon surfaces.

24. The process of claims 22 or 23 wherein comprises additional step ii) and iii):

ii) baking said coating to form a baked coating,

iii) rinsing said baked coating, with an organic solvent, leaving a brush film attached to the metallic surface.

25. The process of any one of claims 22 to 24, wherein said non-metallic surfaces, are Si surfaces, SiO_2 surfaces or a mixture of these two types of surfaces.

26. The process of any one of claims 22 to 25, wherein said metallic surfaces are surfaces which are selected for at least one of a Cu, W, Mo, Al, Zr, Ti, Hf, Ag and Au surfaces.

27. The process of forming a patterned substrate by directed self-assembly comprising steps ib) to vib),