limitations for the coating layers. One significant requirement to meet is to deliver same performance at low cure temperature.

Although there are coating layers suitable for display and semiconductor technology, there is still need for further improvements in coating layers and in methods for their manufacture.

Summary

The following presents a simplified summary in order to provide a basic understanding of some aspects of various embodiments disclosed herein. The summary is not an extensive overview of the disclosure. It is neither intended to identify key or critical elements of the disclosure nor to delineate the scope of the disclosure. The following summary merely presents some concepts of the embodiments disclosed herein in a simplified form as a prelude to a more detailed description of exemplifying embodiments of the disclosure.

In accordance with the disclosure, there is provided a new method for producing a siloxane polymer the method including steps of

(a) admixing a first solvent(s), at least four different silane monomers and at least one bi-silane, to form a mixture,

with the proviso that at least one of the silane monomers or the bi-silane includes an active group capable of achieving cross-linking to adjacent siloxane polymer chains;

(b) subjecting the mixture to an acid treatment so that the silane monomers are at least partially hydrolysed, and the hydrolysed silane monomers, the silane monomers and the bi-silane are at least partially polymerized and at least partially cross-linked;

(c) optionally changing the first solvent to a second solvent; and

(d) subjecting the mixture to a conditions conducive to achieving further cross-linking of the siloxane polymer.

In an aspect, there is provided a method of producing a siloxane polymer composition, the method comprising steps of

(a) admixing at least four different silane monomers and at least one bi-silane to a first solvent(s) to form a mixture,

with the proviso that at least one of the silane monomers or the bi-silane comprises an active group capable of achieving cross-linking to adjacent siloxane polymer chains of the siloxane polymer composition;

(b) subjecting the mixture to an acid treatment so that the silane monomers are at least partially hydrolysed, and the hydrolysed silane monomers, the silane monomers and the bi-silane are at least partially polymerized and cross-linked;

(c) optionally changing the first solvent to a second solvent; and

(d) subjecting the mixture to further cross-linking of the siloxane polymer to achieve a predetermined degree of cross-linking.

According to another embodiment, the present disclosure concerns a siloxane polymer composition obtainable by

(a) admixing a first solvent(s) and at least four different silane monomers and at least one bis-silane, to form a mixture;

with the proviso that at least one of the silane monomers or the bi-silane includes an active group capable of achieving cross-linking to adjacent siloxane polymer chains;

(b) subjecting the mixture to an acid treatment so that the silane monomers are at least partially hydrolysed, and the hydrolysed silane monomers, the silane monomers and the bi-silane are at least partially polymerized and at least partially cross-linked;

(c) optionally changing the first solvent to a second solvent, and

(d) subjecting the mixture to further cross-linking of the siloxane polymer.

In another aspect, there is provided a siloxane polymer composition obtainable as defined above.

According to another aspect the present disclosure concerns use of the siloxane polymer composition as defined above in a process for manufacture of a display or a semiconductor device.

According to another embodiment, the present disclosure concerns a method for covering a substrate, the method including

- providing a siloxane polymer composition obtainable by the method of the present invention, and depositing the siloxane polymer composition on the substrate.

In another aspect, there is provided a method for covering a substrate, the method comprising

- providing a siloxane polymer composition as defined above, and depositing the siloxane polymer composition on the substrate, and
- optionally curing the deposited siloxane polymer composition.

According to still another embodiment, the present disclosure concerns a composition including at least four different silane monomers and at least one bi-silane, wherein at least one of the silane monomers or the bi-silane includes an active group capable of achieving cross-linking, upon thermal or radiation initiation, and a solvent.

In another aspect, there is provided a composition comprising at least four different silane monomers, at least one bi-silane, wherein at least one of the silane monomers or the bi-silane comprises an active group capable of achieving cross-linking upon a thermal or radiation initiation, and a solvent.

Further aspects of the present disclosure are disclosed in dependent claims.

Various exemplifying and non-limiting embodiments of the invention both as to constructions and to methods of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific exemplifying embodiments when read in connection with the accompanying drawings.

The verbs "to comprise" and "to include" are used in this document as open limitations that neither exclude nor require the existence of also un-recited features. The features recited in depending claims are mutually freely combinable unless otherwise explicitly stated.