[029] Surprisingly it has also been found that a process for manufacturing a composition comprising the steps of

a) bringing into contact a fibrous material and the a multistage polymer and a (meth) acrylic polymer (P1)that has a mass average molecular weight Mw of less than 100 000g/mol,

wherein the quantity of multi stage polymer in the composition is between 3wt% and 50wt% yields to a composition that can used in polymeric composite material.

[029a] In another aspect, there is provided a process for manufacturing the composition as defined above, said process comprising the step of

a) bringing into contact a fibrous material and the a multistage polymer and a (meth) acrylic polymer (P1).

[029b] In another aspect, there is provided the use of the composition as defined above or obtained by a process as defined above for manufacturing a polymeric composite material or mechanical or structured parts or articles comprising the polymeric composite material.

[Detailed description of the invention]

[030] According to a first aspect, the present invention relates to a composition comprising

a) a fibrous material and

b) a multi stage polymer,

c) a (meth)acrylic polymer (P1),

wherein the quantity of multi stage polymer in the composition is between 3wt% and 50wt% and the (meth) acrylic polymer (P1) has a mass average molecular weight Mw of less than 100 000g/mol.

[031] According to a second aspect, the present invention relates to a process for manufacturing a preform comprising the steps

a)bringing into contact a fibrous material and the a multistage polymer and a (meth) acrylic polymer (P1)that has a mass average molecular weight Mw of less than 100 000g/mol,

wherein the quantity of multi stage polymer in the preform is between 3wt% and 50wt%.

[032] According to a third aspect, the present invention relates to preform comprising

a) a fibrous material and

b) a multi stage polymer,

c) a (meth)acrylic polymer (P1),

wherein the quantity of multi stage polymer in the preform is between 3wt% and 50wt% and the (meth) acrylic polymer (P1) has a mass average molecular weight Mw of less than 100 000g/mol.

since the matrix based on thermoplastic polymer is fragile, it cannot prevent the propagation of cracks, for example, and as such the final composite material still remains too fragile.

[013] To improve the impact strength of a polymer, it is known practice to add an impact additive, which modifies the impact strength, comprising an elastomeric phase or rubber. Such a rubber can be part of a multistage polymer in form of core shell particles, with one stage that is a rubber or the elastomeric phase. These particles are prepared by emulsion polymerization to form a dispersion and can for example be recovered in powder form. They generally comprise a succession of "hard" and "soft" layers. Two-layer (soft-hard) or three-layer (hard-soft-hard) particles may thus be found. The particle size is generally less than 1 µm and more particularly between 50nm and 500 nm.

[014] The multistage polymer in form of core shell particles is available as agglomerated dry powder, the latter is dispersed in the matrix in order to obtain a homogenous distribution of the initial core shell particles. For certain thermosetting polymers or resins, as especially epoxy resin, but also for thermoplastic polymers it is very difficult or nearly impossible to disperse correctly these multistage polymer particles.

[015] Dispersing these usually weakly cross-linked discrete core shell particles in the liquid syrup or prepolymers in order to impregnate the fibrous reinforcement poses problems during the impregnation step. In fact the particles swell in the syrup which leads to gelation of the syrup. The viscosity is then too high and it is no longer possible to impregnate the fibrous substrate without defects appearing. To avoid this gelation phenomenon, the content of these particles in the resin must be limited to a very low content. However, such a content remains too low and does not conduct to the expected mechanical properties, especially as regards the impact strength.

[016] The objective of the present disclosure is to obtain a composition that comprises a fibrous material, a multistage polymer and a (meth)acrylic polymer suitable for being used in polymeric composite material.

[017] An objective of the present disclosure is also to obtain a stable composition that comprises a fibrous material, a multistage polymer and a (meth)acrylic polymer that can be used for producing an impact modified polymeric composites.

[018] An additional objective of the present disclosure is to obtain a stable preform that comprises a fibrous material, a multistage polymer and a (meth)acrylic polymer.

[019] Another additional objective of the present disclosure is a process to prepare a composition that comprises a fibrous material, a multistage polymer and a (meth)acrylic polymer.

[020] Another objective of the present disclosure is to find a method to introduce a multistage polymer in a polymeric composite material or mechanical or structured parts or articles comprising the polymeric composite material.

[021] Still another objective of the present disclsoure is a process to obtain a stable preform that comprises a fibrous material, a multistage polymer and a (meth)acrylic polymer.

[022] Still an additional disclosure is having a process for for manufacturing an impact modified polymeric composite material or mechanical or structured parts or articles comprising the impact modified polymeric composite material.

[BACKGROUND OF THE INVENTION]Prior art

[023] The document EP1085968 discloses composite articles including prepregs, preforms, laminates and sandwich moldings and methods of making the same. In particularly a strand of a plurality of fibres coated with polymer particles is disclosed. The polymer particle is a thermoplastic polymer or a crosslinked thermoplastic polymer.

[024] The document discloses EP1312453 discloses composite articles including prepregs, preforms, laminates and sandwich moldings and methods of making the same. In particularly a strand of a plurality of fibres coated with polymer particles is disclosed that have an average diameter of less than 5µm. The polymer particle is a thermoplastic polymer or a crosslinked thermoplastic polymer. Polymer particles of small size with between 0.1µm to

0.25µm having high molecular weights of at least 10,000g/mol are mentioned.

[025] None of the prior art documents discloses a composition, a process or use according to the present disclosure.

[Brief description]

[026] Surprisingly it has been found that a composition comprising

a) a fibrous material and

b) a multi stage polymer and

c) a (meth)acrylic polymer (P1),

wherein the quantity of multi stage polymer in the composition is between 3wt% and 50wt% and the (meth) acrylic polymer (P1) has a mass average molecular weight Mw of less than 100 000g/mol, is suitable for being used in polymeric composite material.

[026a] In an aspect, there is provided a composition comprising

a) a fibrous material and

b) a multi stage polymer and

c) a (meth) acrylic polymer (P1),

wherein the quantity of multi stage polymer is between 3wt% and 50wt% of the composition and the (meth) acrylic polymer (P1) has a mass average molecular weight Mw of less than 100 000g/mol

[027] Surprisingly it has been found that a preform comprising

a) a fibrous material and

b) a multi stage polymer and

c) a (meth)acrylic polymer (P1),

wherein the quantity of multi stage polymer in the preform is between 3wt% and 50wt% and the (meth) acrylic polymer (P1) has a mass average molecular weight Mw of less than 100 000g/mol, keeps its shape.

[028] Surprisingly it has also been found that a composition comprising

a) a fibrous material and

b) a multi stage polymer and

c) a (meth)acrylic polymer (P1),

wherein the quantity of multi stage polymer in the preform is between 3wt% and 50wt% and the (meth) acrylic polymer (P1) has a mass average molecular weight Mw of less than 100 000g/mol, can be used for manufacturing a polymeric composite material or mechanical or structured parts or articles comprising the polymeric composite material.