[Brief description]

[025] Surprisingly it has been found that a polymer composition comprising

a) an epoxy resin E1, said epoxy E1 is solid at a temperature below 25°C, and

b) a multi stage polymer,

wherein the multi stage polymer makes up at least 20wt% of the composition that can be easily dispersed in epoxy resin E2.

[025a] In an aspect, there is provided a polymer composition comprising

an epoxy resin E1, said epoxy E1 is solid at a temperature below 25°C, and

a multi stage polymer,

wherein the multi stage polymer makes up at least 30wt% of the composition.

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

a) a epoxy resin E1, said epoxy E1 is solid at a temperature below 25°C, and

b) a multi stage polymer,

wherein the multi stage polymer makes up at least 20wt% of the composition that can be used as masterbatch for epoxy resins.

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

a) mixing of a epoxy resin E1, said epoxy E1 is solid at a temperature below 25°C, and a multi stage polymer

b) recovering the obtained mixture of previous step

wherein the epoxy resin E1 and the multi stage polymer in step a) are in form of a dispersion in aqueous phase that yields to a polymer composition that can be used as masterbatch for epoxy resins.

[027a] In another aspect, there is provided a process for manufacturing a polymer composition comprising the steps of

a) mixing of an epoxy resin E1, said epoxy E1 is solid at a temperature below 25°C, and the multi stage polymer

b) recovering the obtained mixture of previous step

wherein the epoxy resin E1 and the multi stage polymer in step a) are in form of a dispersion in aqueous phase, and

wherein the multi stage polymer makes up at least 30wt% of the composition.

[027b] In another aspect, there is provided the use of the polymer composition as defined above or obtained by the process as defined above as masterbatch in thermosetting resins.

[027c] In another aspect, there is provided an epoxy resin comprising polymer composition polymer composition comprising

a) an epoxy resin E2 and

b) the polymer composition as defined above or obtained by the process as defined above.

[027d] In another aspect, there is provided a process for manufacturing an epoxy resin comprising polymer composition comprising the step of

a) mixing epoxy resin E2 with a masterbatch

characterized that said master batch comprises a polymer composition as defined above or obtained by the process as defined above.

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

a) an epoxy resin E1 said epoxy E1 is solid at a temperature below 25°C, and

b) a polymer obtained by a multistage process with

a) one stage (A) comprising a polymer (A1) having a glass transition temperature of less then 0°C

b) one stage (B) comprising a polymer (B1) having a glass transition temperature of at least 30°C,

Claims

1. A polymer composition comprising
   an epoxy resin E1, said epoxy E1 is solid at a temperature below 25°C, and
   a multi stage polymer,
   wherein the multi stage polymer makes up at least 30wt% of the composition.

2. The polymer composition according to claim 1 characterized that the epoxy resin is solid at a temperature below 50°C, and preferably below 70°C.

3. The polymer composition according to claim 1 or 2 characterized that the epoxy resin is chosen from resorcinol diglycidyl ether, bisphenol A diglycidyl ether, triglycidyl-p-amino-phenol, bromobisphenol F diglycidyl ether, the triglycidyl ether of m-amino-phenol, tetraglycidylmethylenedianiline, the triglycidyl ether of (trihydroxy-phenyl)methane, polyglycidyl ethers of phenol-formaldehyde novolak, poly-glycidyl ethers of ortho-cresol novolak and tetraglycidyl ethers of tetraphenyl-ethane or mixtures thereof.

4. The polymer composition according to any of claims 1 to 3 characterized that the multi stage polymer comprises
   a) one stage (A) comprising a polymer (A1) having a glass transition temperature of less then 0°C
   b), one stage (B) comprising a polymer (B1) having a glass transition temperature of at least 30°C.

5. The polymer composition according to claims 4 characterized that the polymers (A1) and (B1) are acrylic or methacrylic polymers.

6. The polymer composition according to claim 4 characterized that the polymer (A1) is a silicone rubber based polymer

7. The polymer composition according to claim 4 characterized that the polymers (A1) comprises at least 50wt% of polymeric units coming from isoprene or butadiene.

8. The polymer composition according to any of claims 4 to 7 characterized that the stage (A) is the first stage and that stage (B) comprising polymer (B1) is grafted on stage (A) comprising polymer (A1).

9. The polymer composition according to any of claims 1 to 8 characterized that the composition is in form of a polymer powder having a volume median particle size D50 between 1µm and 500µm.

10. The polymer composition according to any of claims 1 to 8 characterized that the composition is a solid composition.

11. The polymer composition according to any of claims 1 to 8 characterized that the composition is in form of a polymer powder comprising epoxy resin E1, said epoxy E1 is solid at a temperature below 25°C, and the multi stage polymer and preferably is a solid free flowing powder.

12. The polymer composition according to any of claims 1 to 8 characterized that the composition is in form of a polymer powder comprising the epoxy resin E1, said epoxy E1 is solid at a temperature below 25°C, as a continuous phase and the multi stage polymer as dispersed phase.

13. A process for manufacturing a polymer composition comprising the steps of

a) mixing of an epoxy resin E1, said epoxy E1 is solid at a temperature below 25°C, and the multi stage polymer

b) recovering the obtained mixture of previous step

wherein the epoxy resin E1 and the multi stage polymer in step a) are in form of a dispersion in aqueous phase, and

wherein the multi stage polymer makes up at least 30wt% of the composition.

14. The process according to claim 13, characterized that the multistage polymer makes up at least 20wt% of the polymer composition.

15. The process according to claim 13 or 14, characterized that the step a) is made before step b).

16. The process according to any of claims 13 to 15, characterized that the recovering step b) is made by coagulation or by spray drying.

17. Use of the polymer composition to any of claims 1 to 12 or obtained by the process according to any of claims 13 to 16 as masterbatch in thermosetting resins.

18. Use according to claim 17 characterized that the thermosetting resin is an epoxy resin E2.

19. An epoxy resin comprising polymer composition polymer composition comprising

a) an epoxy resin E2 and

b) the polymer composition according to any of claims 1 to 12 or obtained by the process according to any of claims 13 to 16.

20. Process for manufacturing an epoxy resin comprising polymer composition comprising the step of

a) mixing epoxy resin E2 with a masterbatch

characterized that said master batch comprises a polymer composition according to any of claims 1 to 12 or obtained by the process according to any of claims 13 to 16.

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