[028] Non of the prior art documents discloses a multistage polymer comprising a stage with a polymer having a low molecular weight.

[Brief description]

[029] Surprisingly it has been found that a polymer composition in form of polymeric particles comprising

a) one stage (A) comprising a polymer (A1) having a glass transition temperature of less then 10°C

b), one stage (B) comprising a polymer (B1) having a glass transition temperature of at least 60°C and

c) one stage (C) comprising a polymer (C1) having a glass transition temperature of at least 30°C

obtained by a multistage process comprising at least three stages, characterized that the polymer (C1) has a mass average molecular weight Mw of less than 100 000g/mol can be easily dispersed in a polymeric matrix material for thermosetting polymers or thermoplastic polymers.

[029a] In an aspect, there is provided a polymer composition in form of polymeric particles comprising

a) one stage (A) comprising a polymer (A1) having a glass transition temperature of less then 10°C

b), one stage (B) comprising a polymer (B1) having a glass transition temperature of at least 60°C and

c) one stage (C) comprising a polymer (C1) having a glass transition temperature of at least 30°C

obtained by a multistage process comprising at least three stages, characterized that the polymer (C1) has a mass average molecular weight Mw of less than 100 000g/mol.

[030] Surprisingly it has also been found that a **method for** manufacturing the polymer composition comprising the steps of

a) polymerizing by emulsion polymerization of a monomer or monomer mixture (A_m) to obtain one layer in stage (A) comprising polymer (A1) having a glass transition temperature of less then 10°C

b) polymerizing by emulsion polymerization of a monomer or monomer mixture (B_m) to obtain layer in stage (B) comprising a polymer (B1) having a glass transition temperature of at least 60°C

c) polymerizing by emulsion polymerization of a monomer or monomer mixture (Cm) to obtain a layer in stage (C) comprising a polymer (C1) having a glass transition temperature of at least 30°C

characterized that the polymer (C1) has a mass average molecular weight Mw of less than 100 000g/mol yields to a polymer composition in form of polymer particles that be easily dispersed in a polymeric matrix material for thermosetting polymers or thermoplastic polymers.

[030a] In another aspect, there is provided a **method for** manufacturing the polymer composition comprising the steps of

a) polymerizing by emulsion polymerization of a monomer or monomer mixture (A_m) to obtain one layer in stage (A) comprising polymer (A1) having a glass transition temperature of less then 10°C

b) polymerizing by emulsion polymerization of a monomer or monomer mixture (B_m) to obtain layer in stage (B) comprising a polymer (B1) having a glass transition temperature of at least 60°C

c) polymerizing by emulsion polymerization of a monomer or monomer mixture (Cm) to obtain a layer in stage (C) comprising a polymer (C1) having a glass transition temperature of at least 30°C

characterized that the polymer (C1) has a mass average molecular weight Mw of less than 100 000g/mol.

[030b] In another aspect, there is provided the use of the polymer composition as defined above or obtained by the method as defined above as an impact modifier.

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

i) a polymer (P1) and

ii) a polymer obtained by a multistage process with

a) one stage (A) comprising a polymer (A1) having a glass transition temperature of less then 10°C

b), one stage (B) comprising a polymer (B1) having a glass transition temperature of at least 60°C and

c) one stage (C) comprising a polymer (C1) having a glass transition temperature of at least 30°C

characterized that the polymer (C1) has a mass average molecular weight Mw of less than 100 000g/mol possesses satisfying impact properties.

[031a] In another aspect, there is provided a polymer composition comprising

i) a polymer (P1) and

ii) a polymer obtained by a multistage process with

a) one stage (A) comprising a polymer (A1) having a glass transition temperature of less then 10°C

b), one stage (B) comprising a polymer (B1) having a glass transition temperature of at least 60°C and

c) one stage (C) comprising a polymer (C1) having a glass transition temperature of at least 30°C

characterized that the polymer (C1) has a mass average molecular weight Mw of less than 100 000g/mol.

[Detailed description of the invention]

[032] According to a first aspect, the present invention relates to a polymer composition in form of polymeric particles comprising

a) one stage (A) comprising a polymer (A1) having a glass transition temperature of less then 10°C

b), one stage (B) comprising a polymer (B1) having a glass transition temperature of at least 60°C and

c) one stage (C) comprising a polymer (C1) having a glass transition temperature of at least 30°C

obtained by a multistage process comprising at least three stages, characterized that the polymer (C1) has a mass average molecular weight Mw of less than 100 000g/mol.

[033] According to a second aspect, the present invention relates to a **method for** manufacturing the polymer composition comprising the steps of

a) polymerizing by emulsion polymerization of a monomer or monomer mixture (A_m) to obtain one layer in stage (A) comprising polymer (A1) having a glass transition temperature of less then 10°C

b) polymerizing by emulsion polymerization of a monomer or monomer mixture (B_m) to obtain layer in stage (B)