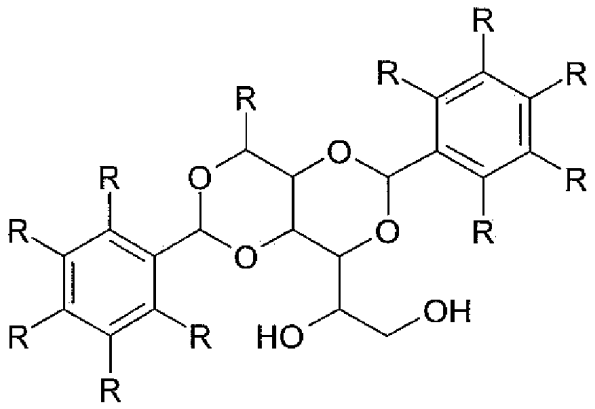
The problem is solved by a composition comprising an at least essentially amorphous polymer and a nucleating agent of formula (1).

Summary

In one aspect, the present disclosure relates to a composition for the preparation of a polymeric foam, and in particular a masterbatch composition, comprising

(i) an at least essentially amorphous polymer resin selected from the group consisting of poly(methyl methacrylate), polyvinyl chloride , polystyrene, polystyrene copolymers polycarbonate, polysulfone, poly(ether sulfone), poly(p-phenylene ether), polyethylene terephthalate glycol-modified, and mixtures or blends thereof, wherein the at least essentially amorphous polymer has a portion of 5 wt. % or less of a crystalline region and at least 95 wt. % of an amorphous region; and

(ii) a nucleating agent of formula (1)



(1)

wherein each R independently is selected from the group consisting of hydrogen, C_1-C_{10}-alkyl, C_5-C_{10}-cycloalkyl, phenyl, phenyl substituted with 1, 2, 3 or 4 C_1-C_4-alkyl groups, and C_1-C_4-alkylene-phenyl.

In another aspect, the present disclosure relates to a foamed polymeric article comprising (i) 80 % to 98.99 % by weight of an at least essentially amorphous polymer, (ii) 0.01 % to 0.5 % by weight of a nucleating agent of formula (1), (iii) 1 to 10 % by weight of a blowing agent selected from carbon dioxide, nitrogen, argon, water, air, nitrous oxide, helium, or combinations thereof and/or an organic blowing agent and (iv) 0 to 18.99 % by weight of further additives, wherein (i) and (ii) are as defined herein.

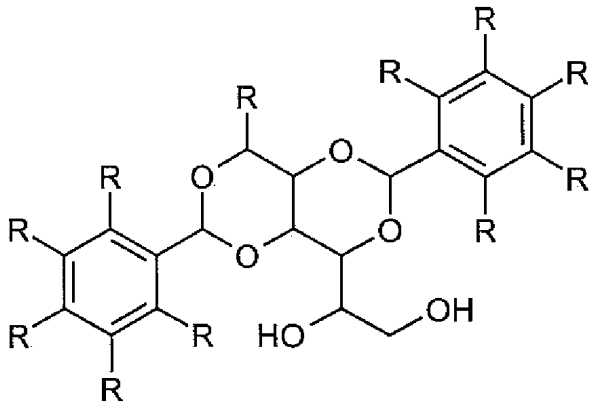
In a further aspect, the present disclosure relates to a method for preparing a foamed polymeric article as disclosed herein, comprising the steps of

Patent claims

1. A composition for the preparation of a polymeric foam, and in particular a masterbatch composition, comprising

(i) an at least essentially amorphous polymer resin selected from the group consisting of poly(methyl methacrylate), polyvinyl chloride , polystyrene, polystyrene copolymers polycarbonate, polysulfone, poly(ether sulfone), poly(p-phenylene ether), polyethylene terephthalate glycol-modified, and mixtures or blends thereof, wherein the at least essentially amorphous polymer has a portion of 5 wt. % or less of a crystalline region and at least 95 wt. % of an amorphous region; and

(ii) a nucleating agent of formula (1)



(1)

wherein

each R independently is selected from the group consisting of hydrogen, C_1-C_{10}-alkyl, C_5-C_{10}-cycloalkyl, phenyl, phenyl substituted with 1, 2, 3 or 4 C_1-C_4-alkyl groups, and C_1-C_4-alkylene-phenyl.

2. The composition according to claim 1, wherein each R independently is selected from the group consisting of hydrogen, C_1-C_4-alkyl, C_5-C_6-cycloalkyl, phenyl, phenyl substituted with 1 or 2 C_1-C_3-alkyl groups, and benzyl.

acrylonitrile-butadiene-styrene copolymers, styrene-acrylonitrile copolymers, and acrylonitrile-styrene-acrylate copolymers.

10. The composition as claimed in any of claims 1 to 9, characterized in that it further comprises a blowing agent and/or an inorganic nucleating agent.

11. The composition as claimed in any of claims 1 to 9, comprising the nucleating agent of formula (1) in a relative amount of 0.001 to 50 % by weight of the total weight of the composition.

12. A foamed polymeric article comprising (i) 80 % to 98.99 % by weight of an at least essentially amorphous polymer, (ii) 0.01 % to 0.5 % by weight of a nucleating agent of formula (1), (iii) 1 to 10 % by weight of a blowing agent selected from carbon dioxide, nitrogen, argon, water, air, nitrous oxide, helium, or combinations thereof, and/or an organic blowing agent and (iv) 0 to 18.99 % by weight of further additives, wherein (i) and (ii) are as defined in any of claims 1 to 11.

13. A method for preparing a foamed polymeric article as claimed in claim 12, comprising the steps of

(a) adding a nucleating agent of formula (1)
and optionally further additives
to an at least essentially amorphous polymer to obtain a polymer composition;

(b) melting the polymer composition obtained in step (a) to obtain a polymer melt; and

(c) extruding the polymer melt of step (b) in an extruder in the presence of a blowing agent;

(d) cooling the extruded polymer melt and forming a foamed polymeric article.