(ii) a stage of kneading said mixture in the molten state, whereby a composition (C2) having a targeted inherent viscosity is obtained; where the residence time of the mixture in stage (ii) is less than 5 minutes;

(iii) a stage of recovery of the composition (C2);

where the chain cutting agent is chosen from:

- water, where stage (i) is provided with from 0.1% to 8%, by weight of water, with respect to the weight of the composition (C1),

- a carboxylic acid, where stage (i) is provided with from 0.1% to 2%, by weight of carboxylic acid, with respect to the weight of the composition (C1),

- an amino acid, where stage (i) is provided with from 0.1% to 10%, by weight of amino acid, with respect to the weight of the composition (C1), and/or

their mixture

In the context of the present disclosure, the composition (C1) can be any type of industrial compositions based on polyamides, for example powders, granules, filaments, resins, fibers, films, pipes and/or their mixtures.

Within the meaning of the present disclosure, the term “a composition based on polyamides” is understood to mean a composition having a polyamide matrix,

CLAIMS

1. A process for the treatment of a composition (C1) based on polyamides (PA) which is intended to be recycled, comprising the following successive stages:

(i) a stage of supplying a mixture comprising the composition (C1) based on polyamides (PA), a polyamide chain-cutting agent, and optionally one or more filler(s) and/or additive(s);

(ii) a stage of kneading said mixture in the molten state, whereby a composition (C2) having a targeted inherent viscosity is obtained; where the residence time of the mixture in stage (ii) is less than 5 minutes;

(iii) a stage of recovery of the composition (C2);

where the chain cutting agent is chosen from:

- water, where stage (i) is provided with from 0.1% to 8%, by weight of water, with respect to the weight of the composition (C1),

- a carboxylic acid, where stage (i) is provided with from 0.1% to 2%, by weight of carboxylic acid, with respect to the weight of the composition (C1),

- an amino acid, where stage (i) is provided with from 0.1% to 10%, by weight of amino acid, with respect to the weight of the composition (C1), and/or

their mixture.

2. The process as claimed in claim 1, where the composition (C1) is a powder based on polyamides, preferably that which has not been transformed on conclusion of a process of 3D printing by sintering.

3. The process as claimed in claim 1 or 2, where the composition (C1) has an inherent viscosity of greater than or equal to 1.50.

4. The process as claimed in one of the preceding claims, where the inherent viscosity of the recovered composition (C2) is reduced by at least 10%, preferably by at least 20%, with respect to that of the composition (C1).

5. The process as claimed in one of the preceding claims, where the chain-cutting agent is a carboxylic acid, chosen from monocarboxylic acids, dicarboxylic acids, metal salts of mono- or dicarboxylic acids, preferably chosen from adipic acid, azelaic acid, suberic acid, sebacic acid, dodecanedioic acid, and/or their mixture.

6. The process as claimed in claim 5, where stage (i) is provided with from 0.2% to 0.8%, by weight of carboxylic acid, with respect to the weight of the composition (C1).

7. The process as claimed in one of the preceding claims, where the chain-cutting agent is an amino acid chosen from aminocaproic acid, 7-aminoheptanoic acid, 11-aminoundecanoic acid, 12-aminododecanoic acid, and/or their mixture.

8. The process as claimed in claim 1, where a temperature greater by at least 5°C, preferably greater by at least 10°C, with respect to the melting point of polyamides (PA), and below 330°C, is applied in the kneading stage (ii).

9. The process as claimed in one of the preceding claims is a batch process.

10. The process as claimed in one of the preceding claims is a continuous process.

11. The process as claimed in one of the preceding claims, where the polyamide (PA) is chosen from a homopolyamide, a copolyamide, a copolymer having polyamide blocks and polyether blocks, and their blends.

12. The process as claimed in claim 11, where the polyamide (PA) comprises at least one polyamide or one polyamide block chosen from polyamides and copolyamides comprising at least one of the following monomers: 46, 4T, 54, 59, 510, 512, 513, 514, 516, 518, 536, 6, 64, 66, 69, 610, 612, 613, 614, 616, 618, 636, 6T, 9, 104, 109, 1010, 1012, 1013, 1014, 1016, 1018, 1036, 10T, 11, 12, 124, 129, 1210, 1212, 1213, 1214, 1216, 1218, 1236, 12T, MXD6, MXD10, MXD12, MXD14, and their blends.