mol% of a first monomer being an isohexide; between 40 and 60 mol %, preferably between 45 and 55 mol %, more preferably between 47 and 52 mol % of a second monomer being an aromatic dicarboxylic acid or a cycloaliphatic dicarboxylic acid; and between 1 and 20 mol %, preferably between 3 and 15 mol %, more preferably between 5 and 10 mol % of a third monomer being an aliphatic diol, the copolyester having an acid number of between 10 and 50, preferably between 12 and 45, more preferably between 15 and 35.

The copolyester of the present invention is obtainable by reacting the above indicated amounts of the first, second and third monomers as will be explained later.

In chemistry, acid value (or "neutralization number" or "acid number" or "acidity") is expressed as the mass of potassium hydroxide (KOH) in milligrams that is required to neutralize one gram of chemical substance. The acid number is a measure of the amount of carboxylic acid groups in a chemical compound, e.g. a polyester according to the present invention, or in a mixture of compounds. In a typical procedure, a known amount of sample dissolved in a solvent is titrated with a solution of potassium hydroxide with known concentration and with a color indicator, e.g. phenolphthalein or by using a combined electrode (potentiometric titration).

The acid number should not be below 10, which may lead to very unstable dispersions of the polyester in water (latex). The polyester may precipitate. The acid number should also not be above 50, because above that level the polyester may dissolve. So outside the above stated range of the acid number it is hard or even impossible to obtain a dispersion of the polyester in water.

Thus, in one aspect, there is provided a copolyester from between 30 and 50 mol % of a first monomer being an isohexide; between 40 and 60 mol % of a second monomer being a cycloaliphatic dicarboxylic acid; and between 1 and 20 mol % of a third monomer being an aliphatic diol, the copolyester having an acid number of between 10 and 50.

In another aspect, there is provided a process for preparing a copolyester as defined above comprising the steps of:

a. bringing between 30 and 50 mol % of a first monomer being an isohexide; between 40 and 60 mol % of a second monomer being an aromatic dicarboxylic acid or a cycloaliphatic dicarboxylic acid; and between 1 and 20 mol % of a third monomer being a branched aliphatic diol in a reactor under an inert atmosphere;

b. heating the mixture to a temperature of between 150°C and 200°C until the mixture obtained in step a has melted;

c. adding a condensation catalyst in an amount up to 1 mol% with respect to the mixture obtained in step a;

d. stirring the reaction mixture for at least 1 hour at a temperature of between 200°C and 300°C;

e. removing the obtained reaction water;

f. stirring the reaction mixture for at least another hour at a temperature of between 200°C and 300°C and under vacuum;

g. cooling the reaction product under an inert atmosphere to room temperature.

In another aspect, there is provided a latex composition comprising water as a medium and between 10 and 50 wt% particles of a copolyester as defined above dispersed in the medium, the particles having an average diameter of between 10 and 1000 nm.

In another aspect, there is provided a latex composition comprising water as a medium and between 10 and 50 wt% particles of a copolyester as defined above or a copolyester obtainable by a process as defined above, the copolyester having an acid number of between 10 and 50, the particles being dispersed in the medium, the particles having an average diameter of between 10 and 1000nm, the latex composition further comprising a cosolvent and/or a surface tension modifying agent.

In another aspect, there is provided a process for preparing a latex composition as defined above, comprising the steps of:

i. dissolving a copolyester resin as defined above having an acid number of between 10 and 50 in a water-soluble solvent, whereby the weight ratio of resin to solvent ranges between 0.1 and 2.5;

ii. adding a deprotonating agent, being a water-soluble base, preferably selected from the group consisting of triethylamine, triethanolamine, ammonium hydroxide, sodium hydroxide, potassium hydroxide and sodium carbonate to the mixture in an amount such that the molar amount of deprotonating groups ranges between 0.5 and 1.5 times the molar amount KOH necessary to determine the acid number of the polyester resin;

iii. heating the mixture obtained in step ii to a temperature of between 35°C and 90°C;

iv. separately heating an amount of water to a temperature substantially equal to the temperature of step iii, the amount of water being in the range of between 2 and 6 times the weight of the polyester resin;

v. adding the water obtained in step iv to the mixture obtained in step iii under vigorous stirring at a speed of between 1600 and 2200 rpm;

vi. removing the solvent by distillation.

In another aspect, there is provided an ink composition comprising a latex composition as defined above or as obtained according to a process as defined above.

DETAILED DESCRIPTION

The invention will now be explained detail with reference to the Figure 1:

Fig. 1 shows a schematic representation of an ink jet printing assembly suitable for jetting an ink according to the present invention.