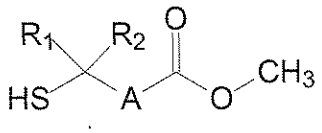
[0013] Another advantage associated with the use of the mercapto-methyl esters of carboxylic acids according to the present ~~invention~~ disclosure lies in the fact that these mercapto-esters can be obtained from renewable raw materials and in particular from raw materials of vegetable origin.

[0014] In addition, these mercapto-esters, which will be defined later, also have the advantage of not being odorous, or being weakly odorous, and do not require particular precautions during uses thereof.

[0015] According to a first aspect, ~~the present invention thus relates to~~ there is provided the use, as a chain transfer agent in a free-radical emulsion polymerization process of at least one mercapto-methyl ester of a carboxylic acid, represented by formula (1) below:

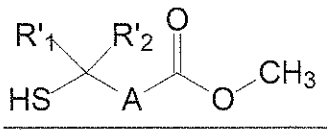


(1)

in which:

- R_1 and R_2, which may be identical or different, are chosen, independently of one another, from a hydrogen atom and a linear, branched or cyclic, saturated or unsaturated hydrocarbon-based radical comprising from 1 to 20 carbon atoms, and optionally substituted with one or more radicals chosen from carboxy, alkylcarbonyl and alkoxycarbonyl (where alkyl and alkoxy comprise from 1 to 10 carbon atoms); and
- A represents a linear, branched or cyclic, saturated or unsaturated, hydrocarbon-based divalent chain comprising from 2 to 30 carbon atoms, limits included, optionally interrupted with one or more heteroatoms chosen from oxygen, sulfur and nitrogen.

[0015a] According to a second aspect, there is provided compounds of formula (1') below:



(1')

in which:

- R'_1 represents a linear, branched or cyclic, saturated or unsaturated hydrocarbon-based radical comprising from 1 to 20 carbon atoms, substituted

with one or more alkoxycarbonyl radicals, where alkoxy comprises from 1 to 10 carbon atoms;

- R'_2 is chosen from a hydrogen atom and a linear, branched or cyclic, saturated or unsaturated hydrocarbon-based radical comprising from 1 to 20 carbon atoms, substituted with one or more alkoxycarbonyl radicals, where alkoxy comprises from 1 to 10 carbon atoms; and

- A represents a linear, branched or cyclic, saturated or unsaturated, hydrocarbon-based divalent chain comprising from 2 to 30 carbon atoms, limits included, optionally interrupted with one or more heteroatoms chosen from oxygen, sulfur and nitrogen.

[0015b] According to a third aspect, there is provided an emulsion (co)polymerization process comprising at least the following steps:

a) forming an emulsion, in an aqueous medium, of at least one monomer containing vinyl unsaturation,

b) adding to said emulsion at least one chain transfer agent of formula (1) as defined above,

c) carrying out the (co)polymerization reaction, optionally in the presence of a (co)polymerization initiator,

d) optionally purifying and recovering the desired (co)polymer.

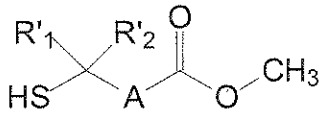
[0016] According to a first embodiment of the invention, the compounds of formula (1) for which R_1 and R_2 are identical and each represent a hydrogen atom (primary mercaptans) are preferred.

[0017] According to another embodiment, the use according to the invention uses at least one compound of formula (1) in which R_1 represents a hydrogen atom and R_2 represents a linear, branched or cyclic, saturated or unsaturated hydrocarbon-based radical comprising from 1 to 20 carbon atoms, and optionally substituted as defined previously (secondary mercaptans).

any proportions, more preferably from decen-9-oic acid and undecen-10-oic acid.

[0042] Among the compounds of formula (1), preference is given to those for which R_1 represents a linear, branched or cyclic, saturated or unsaturated hydrocarbon-based radical comprising from 1 to 20 carbon atoms, substituted with one or more alkoxycarbonyl radicals, where alkoxy comprises from 1 to 10 carbon atoms, and R_2 represents hydrogen, on the one hand, and R_1 and R_2, which may be identical or different, each represent a linear, branched or cyclic, saturated or unsaturated hydrocarbon-based radical comprising from 1 to 20 carbon atoms, substituted with one or more alkoxycarbonyl radicals, where alkoxy comprises from 1 to 10 carbon atoms.

[0043] Thus and according to another ~~aspect~~embodiment, the present invention relates to the compounds of formula (1') below:



(1')

in which:

- R'_1 represents a linear, branched or cyclic, saturated or unsaturated hydrocarbon-based radical comprising from 1 to 20 carbon atoms, substituted with one or more alkoxycarbonyl radicals, where alkoxy comprises from 1 to 10 carbon atoms;
- R'_2 is chosen from a hydrogen atom and a linear, branched or cyclic, saturated or unsaturated hydrocarbon-based radical comprising from 1 to 20 carbon atoms, substituted with one or more alkoxycarbonyl radicals, where alkoxy comprises from 1 to 10 carbon atoms; and
- A represents a linear, branched or cyclic, saturated or unsaturated, hydrocarbon-based divalent chain comprising from 2 to 30 carbon atoms, limits included, optionally interrupted with one or more heteroatoms chosen from oxygen, sulfur and nitrogen.

[0044] The compounds of formula (1') form a subset of the compounds of formula (1), all of the compounds of formula (1') being included in general formula (1). The compounds of formula (1') for which R'_1 represents a linear, branched or cyclic, saturated or unsaturated hydrocarbon-based radical comprising from 1 to 20 carbon atoms, substituted with a methoxycarbonyl