CLAIMS

1. A process for the continuous synthesis of a compound of formula (II) $Br-(CH_2)_{n+2}-COOR$, comprising a stage consisting of:

(a) the hydrobromination of a compound of formula (I) $CH_2=CH-(CH_2)_n-COOR$:

where, in the formulae (I) and (II), n is an integer of between 7 and 9, and R is chosen from H or a linear or branched alkyl radical comprising from 1 to 10 carbon atoms, in particular methyl, ethyl, isopropyl or propyl,

with HBr in the presence of a radical initiator and of at least one solvent;

said process being characterized in that the reaction is carried out in the absence of benzene and of toluene and in that, in stage (a), the HBr is injected into the reaction mixture in the gaseous form and in stoichiometric excess.

2. The process as claimed in claim 1, characterized in that the ratio of the molar flow rate of HBr injected in stage (a) to the molar flow rate of the compound of formula (I) injected in stage (a) is from 1.2 to 3, preferably from 1.3 to 2.2, more preferentially from 1.4 to 2 and in particular from 1.5 to 1.9.

3. The process as claimed in claim 1 or 2, characterized in that the outlet stream from the reactor of the liquid reaction mixture on conclusion of stage (a) comprises at least 2%, preferably at least 3%, and more preferentially at least 3.5% and in particular at least 4% by weight of HBr.

4. The process as claimed in one of claims 1 to 3, characterized in that the process additionally comprises the subsequent stages consisting of:

(b) the separation of the excess HBr from the liquid reaction mixture resulting from stage (a);

(b1) optionally, separation of the excess HBr from the gaseous reaction mixture resulting from stage (a); and

(c) the recycling of the HBr separated in stage (b) and (b1) if appropriate to stage (a).

5. The process as claimed in one of claims 1 to 4, comprising the stages consisting of:

(a1) introduction of the compound of formula (I), of the HBr, of the initiator and of the solvent(s) into a first reactor at an appropriate temperature for an appropriate residence time;

(a2) withdrawal of the reaction mixture from the first reactor and introduction into an item of separation equipment; if appropriate, followed by a subsequent stage of:

(b) separation of the residual HBr from the reaction mixture; and

(c) recycling of the separated HBr to stage (a1).

6. The process as claimed in one of claims 1 to 5, characterized in that stage (a) is carried out at a temperature of between 5 and 50°C, preferably between 10 and 40°C and very particularly from 20 to 30°C.

7. The process as claimed in one of claims 1 to 6, characterized in that the radical initiator is molecular oxygen used as is or as a mixture with inert gases, for example air or oxygen-enriched air.

8. The process as claimed in claim 5 to 7, characterized in that the first reactor is a stirred vessel with a self-priming turbine or a jet loop reactor comprising a venturi.

9. The process as claimed in one of claims 5 to 8, characterized in that the item of separation equipment is a stirred vessel or a column.

10. The process as claimed in one of claims 1 to 9, characterized in that it is carried out in the absence of aromatic solvent.

11. The process as claimed in one of claims 1 to 10, characterized in that the product of formula (I) is chosen from 11-bromoundecanoic acid, 10-bromodecanoic acid and 9-bromononanoic acid.

12. The process as claimed in one of claims 1 to 11, characterized in that the solvent is chosen from cyclohexane, methylcyclohexane, heptane, methylcyclopentane, n-hexane, 2-methylhexane, 3-methylhexane, n-heptane, isooctane, petroleum ether, tetralin, 1,1,1-trichloroethane, dibromoethane, chloroform, carbon tetrachloride, tetrachlorethylene, 1-bromopropane, dimethyl carbonate, tetrahydrofuran, 1,4 dioxane, 2-methyltetrahydrofuran, tetrahydropyran, 1-propoxypropane, 1-ethoxybutane, 2-isopropoxypropane, acetonitrile and their mixtures.

13. A process for the synthesis of a compound of formula (III) NH_2-$(CH_2)_{n+2}$-COOR, comprising a stage consisting of:

(i) ammonolysis on the compound of formula (II) obtained by the process as claimed in one of claims 1 to 12; and

(ii) separation of the compound of formula (III) NH_2-$(CH_2)_{n+2}$-COOR formed.

14. A process for the synthesis of a polyamide or copolyamide comprising the stage of polycondensation of the compound of formula (III) obtained by the process as claimed in claim 13, alone or as a mixture with other monomers.