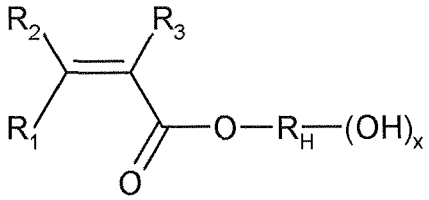
[0008a] In a first aspect, there is provided a polyurethane fluoropolymer [polymer ($F_p$)] obtainable by reacting: (i) at least one fluoropolymer [polymer (F)] selected from:

- a polymer ($F_1$) comprising recurring units derived from vinylidene fluoride (VDF) and from at least one (meth)acrylic monomer [monomer (MA)] having formula (I) here below:



(I)

wherein:

- $R_1$, $R_2$ and $R_3$, equal to or different from each other, are independently selected from a hydrogen atom and a $C_1$-$C_3$ hydrocarbon group,
- $R_H$ is a $C_1$-$C_{10}$ hydrocarbon group ~~comprising from 1 to 5 hydroxyl groups, x being an integer comprised between 1 and 5, and,~~ optionally~~,~~ comprising one or more functional groups selected from double bonds, epoxy, ester, ether and carboxylic acid groups, and x is an integer comprised between 1 and 5, and

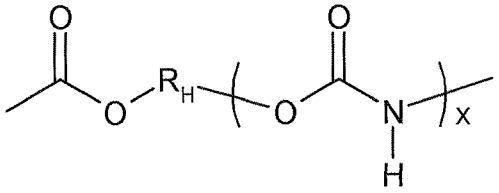
- a polymer ($F_2$) comprising recurring units derived from ethylene (E), from at least one fluorinated monomer (F) selected from tetrafluoroethylene (TFE), chlorotrifluoroethylene (CTFE) and mixtures thereof, and from at least one (meth)acrylic monomer [monomer (MA)] having formula (I),

with

(ii) at least one isocyanate compound comprising at least one isocyanate functional group [compound (I)],

(iii) optionally in the presence of one or more chain extenders,

said polyurethane fluoropolymer [polymer ($F_p$)] comprising at least one bridging group having formula (a) here below:



(a)

wherein:

- $R_H$ is a $C_1$-$C_{10}$ hydrocarbon group ~~comprising from 1 to 5 urethane moieties, x being an integer comprised between 1 and 5, and,~~ optionally~~,~~ comprising one or more functional groups selected from double bonds, epoxy, ester, ether and carboxylic acid groups, and x is an integer comprised between 1 and 5.

[0008b] In another aspect, there is provided a process for the manufacture of the polyurethane fluoropolymer [polymer ($F_P$)] as defined above, the process comprising blending at least one polymer (F), at least one isocyanate compound (I) and, optionally, one or more chain extenders, optionally in the presence of a liquid medium, under temperatures comprised between 20°C and 300°C, preferably between 20°C and 250°C.

[0008c] In still another aspect, there is provided a membrane comprising at least one polyurethane fluoropolymer [polymer ($F_P$)] as described above.

[0008d] In still another aspect, there is provided a polyurethane foam material comprising at least one polyurethane fluoropolymer [polymer ($F_P$)] as described above.

[0009] By the term "fluoropolymer [polymer (F)]", it is hereby intended to denote a polymer comprising one or more recurring units derived from at least one fluorinated monomer (F).

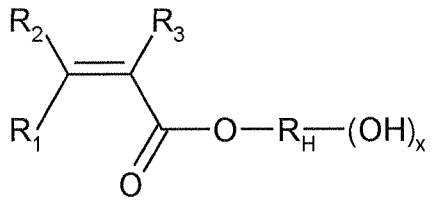
[0010] The fluoropolymer [polymer (F)] is advantageously free from urethane

## Claims

1. A polyurethane fluoropolymer [polymer ($F_p$)] obtainable by reacting:

(i) at least one fluoropolymer [polymer (F)] selected from:

- a polymer ($F_1$) comprising recurring units derived from vinylidene fluoride (VDF) and from at least one (meth)acrylic monomer [monomer (MA)] having formula (I) here below:



(I)

wherein:

- $R_1$, $R_2$ and $R_3$, equal to or different from each other, are independently selected from a hydrogen atom and a $C_1$-$C_3$ hydrocarbon group,
- $R_H$ is a $C_1$-$C_{10}$ hydrocarbon group, optionally comprising ~~from 1 to 5 hydroxyl groups, x being an integer comprised between 1 and 5, and, optionally, comprising~~ one or more functional groups selected from double bonds, epoxy, ester, ether and carboxylic acid groups, and
- x is an integer comprised between 1 and 5, and

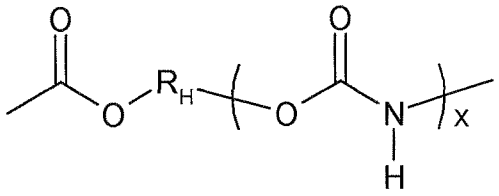
- a polymer ($F_2$) comprising recurring units derived from ethylene (E), from at least one fluorinated monomer (F) selected from tetrafluoroethylene (TFE), chlorotrifluoroethylene (CTFE) and mixtures thereof, and from at least one (meth)acrylic monomer [monomer (MA)] having formula (I),

with

(ii) at least one isocyanate compound comprising at least one isocyanate functional group [compound (I)],

(iii) optionally in the presence of one or more chain extenders,

said polyurethane fluoropolymer [polymer ($F_p$)] comprising at least one bridging group having formula (a) here below:



(a)

wherein:

- $R_H$ is a $C_1$-$C_{10}$ hydrocarbon group optionally comprising ~~from 1 to 5 urethane moieties, x being an integer comprised between 1 and 5, and, optionally, comprising~~ one or more functional groups selected from double bonds, epoxy, ester, ether and carboxylic acid groups, and x is an integer comprised between 1 and 5.

2. The polyurethane fluoropolymer [polymer ($F_P$)] according to claim 1, comprising:
- from 0.01% to 99.99% by weight, preferably from 0.05% to 99.95% by weight, based on the weight of said polymer ($F_P$), of at least one fluorinated block comprising a fluorocarbon chain [chain ($R_{FC}$)], and
- from 99.99% to 0.01% by weight, preferably from 99.95% to 0.05% by weight, based on the weight of said polymer ($F_P$), of at least one hydrogenated block comprising a hydrocarbon chain [chain ($R_{HC}$)],
said blocks being linked to each other by one or more urethane moieties.

3. The polyurethane fluoropolymer [polymer ($F_P$)] according to claim 1 or 2, wherein the fluoropolymer [polymer (F)] comprises from 0.01% to 10% by moles of recurring units derived from at least one (meth)acrylic monomer (MA) having formula (I).

4. The polyurethane fluoropolymer [polymer ($F_p$)] according to any one of claims 1 to 3, obtainable by reacting:
(i) at least 50% by weight, based on the total weight of the polymer (F) and the compound (I), of at least one fluoropolymer [polymer (F)] as defined in claim 1, with
(ii) less than 50% by weight, based on the total weight of the polymer (F) and the compound (I), of at least one isocyanate compound comprising at least one isocyanate functional group [compound (I)],
(iii) optionally in the presence of one or more chain extenders.

5. The polyurethane fluoropolymer [polymer ($F_P$)] according to claim 4,