CLAIMS

1. A copolymer obtained by polymerization using a monomer mixture comprising:
   - at least 50 to 99 mol% of at least one anionic monomer (a) comprising a polymerizable unsaturated function and a carboxylic group; and
   - at least 1 to 50 mol% of at least one monomer (b) of formula (I):

     $H_2C = C (– R_1) – (CH_2)_p – O – [(EO)_n – (PO)_m] – H$ (I)

     in which:

     R_1 represents a hydrogen atom or a CH_3 group;

     p is 1 or 2;

     $[(EO)_n – (PO)_m]$ represents a polyalkoxyl chain made of ethoxyl units EO and propoxyl units PO, distributed in blocks, alternately or randomly;

     m and n represent integers ranging between 1 and 250, the sum of m and n being greater than or equal to 10, with the proviso that the mole proportion of the ethoxyl units in the polyalkoxyl chain (n)/(m+n) is greater than or equal to 70% and strictly less than 90%,

   wherein

   -the monomer (b) is water soluble, and

   -the sum of the molar percentages of each of the monomers is equal to 100%.

2. The copolymer as claimed in the preceding claim, in which said monomer(s) (b) are of formula (I') below:

   $H_2C = C (– R_1) – CH_2 – O – [(EO)_n – (PO)_m] – H$ (I')

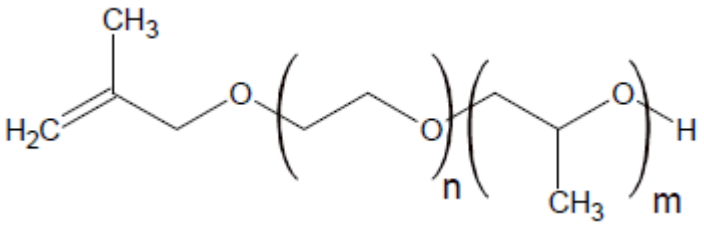
   in which R_1, n and m are as defined in claim 1.

3. The copolymer as claimed in claim 1 or 2, characterized in that it is formed from at least one monomer (b) of formula (II) below:

   $H_2C = C (–CH_3) – CH_2 – O – [(EO)_n – (PO)_m] – H$ (II)

   in which n and m are as defined in claim 1.

4. The copolymer as claimed in any one of the preceding claims, characterized in that it is formed from at least one monomer (b) of formula (III) below:



(III)

m and n being as defined in claim 1.

5. The copolymer as claimed in any one of the preceding claims, in which the mole proportion of the ethoxyl units in the polyalkoxyl chain of said monomer(s) (b) is between 70% and 88%, in particular is greater than or equal to 75%, and especially less than or equal to 85%, in particular less than or equal to 80%.

6. The copolymer as claimed in any one of the preceding claims, in which the total number of ethoxyl and propoxyl units (m+n) of the polyalkoxyl chain of the monomer (b) is between 10 and 150, in particular between 18 and 110 and more particularly between 20 and 70.

7. The copolymer as claimed in any one of the preceding claims, in which said monomer(s) (b) represent from 5 to 40 mol%, in particular from 5 to 30 mol% and more particularly from 10 to 20 mol%, of the total number of constituent moles of said copolymer.

8. The copolymer as claimed in any one of the preceding claims, in which said anionic monomer(s) (a) are chosen from the group consisting of acrylic acid, methacrylic acid, maleic acid, itaconic acid, crotonic acid, and mixtures of these monomers, and in particular are chosen from acrylic acid, methacrylic acid, and a mixture thereof.

9. The copolymer as claimed in any one of the preceding claims, in which said monomer(s) (a) represent from 60 to 95 mol%, in particular from 70 to 95 mol% and more particularly from 80 to 90 mol%, of the total number of moles of constituent monomers of said copolymer.

10. The copolymer as claimed in any one of the preceding claims, obtained by polymerization using a monomer mixture comprising, in addition of said anionic monomer(s) (a) and said monomer(s) (b) of formula (I), one or more monomers (c) chosen from:

- 2-acrylamino-2-methylpropane sulfonic acid (AMPS);
- vinylsulfonates, in particular sodium styrene sulfonate;
- amines;
- phosphonic monomers, such as alkyl vinylphosphonates and alkyl phosphonates;
- the macromonomers of formula (VI) below:

$$R_a – [(EO)_q – (PO)_r – (BO)_s] – R_a' \quad (VI)$$

in which:

$[(EO)_q – (PO)_r – (BO)_s]$ represents a polyalkoxyl chain made of alkoxyl units, distributed in blocks, alternately or randomly, chosen from ethoxyl units EO, propoxyl units PO and butoxyl units BO;

q, r and s represent, independently of each other, 0 or an integer ranging between 1 and 250, the sum of m, n and p being between 10 and 250;

R_a represents a radical chosen from the group consisting of acrylic esters, methacrylic esters and a mixture of these esters; and

R_a' represents hydrogen or an alkyl group containing from 1 to 4 carbon atoms;

- the hydrophobic monomers of formula (VII) below:

$$R_b – [(EO)_t – (PO)_u – (BO)_v] – R_b' \quad (VII)$$

in which:

$[(EO)_t – (PO)_u – (BO)_v]$ represents a polyalkoxyl chain made of alkoxyl units, distributed in blocks, alternately or randomly, chosen from ethoxyl units EO, propoxyl units PO and butoxyl units BO;

t, u and v represent, independently of each other, 0 or an integer ranging between 1 and 250, the sum of m, n and p being between 10 and 250;

R_b represents a radical chosen from the group consisting of acrylic esters, methacrylic esters and a mixture of these esters; and

R_b' represents an alkyl group containing from 8 to 40 carbon atoms; and

- crosslinking monomers,

wherein the monomer (c) represent less than 20% , in particular less than 15%, especially less than 10% and more particularly less than 5%mol of the total number of moles of constituent monomers in the copolymer.

11. A hydraulic composition comprising at least one copolymer as defined according to any one of claims 1 to 10.

12. The composition as claimed in claim 11, comprising from 0.05 to 3% by weight of one or more copolymers as defined according to any one of claims 1 to 10, in particular from 0.25 to 2.5% by weight, relative to the total weight of said composition.

13. The use of a copolymer as defined according to any one of claims 1 to 10, as a water-reducing agent in a hydraulic composition.

14. A water-reducing agent for hydraulic compositions comprising at least one copolymer as defined according to any one of claims 1 to10.