solvent systems for fluoropolymers can advantageously replace the reference solvent, which is NMP.

[0016] This is because the techniques described in the prior art show that the dissolution of the fluoropolymers in the solvent system has to be carried out under hot conditions, that is to say at a temperature of at least 50°C.

[0017] The techniques of the prior art also teach that the solutions obtained have to be used rapidly after preparation, a person skilled in the art thus understanding that the solutions obtained are not stable over time, or are not stable when they are cooled to ambient temperature or to the temperature at which the solution of fluoropolymers is formed.

[0018] In addition, the techniques of the prior art do not appear to be concerned with the problem of the viscosities of the solutions obtained, which nevertheless is of very great importance for the forming of the fluoropolymers and which is one of the reasons why NMP is widely used today. This is because the solutions of fluoropolymers in NMP exhibit low viscosities, making it possible to obtain solutions having a high content of polymers and thus to use less solvent for the preparation of films.

Summary

[0019] Thus, one of the objectives of the embodiments disclosed herein~~present invention~~ is to provide a solvent system for fluoropolymers which does not exhibit the abovementioned disadvantages encountered in the prior art.

[0020] More specifically, a first objective of the present ~~invention~~disclosure is to provide a solvent system for fluoropolymers which is less toxic than NMP, in particular weakly toxic, indeed even nontoxic.

[0021] Another objective is to provide a solvent system for fluoropolymers which does not require heating the solution, or at the very least heating to a temperature of the order of, indeed even less than, 50°C, and preferably makes possible the dissolution of the said fluoropolymers at ambient temperature.

[0022] Yet another objective is to provide a solvent system for fluoropolymers which results in solutions which are stable over time, that is to say solutions for which the stability over time is similar to that obtained with solutions in NMP, and generally more stable than with the known solvents of the prior art, such as NMP, DMSO, ketones, DMAC and others.

[0023] Yet another objective is to provide a solvent system for fluoropolymers resulting in polymer solutions for which the viscosity is similar to the viscosity of solutions of fluoropolymers in NMP and generally for which the viscosity is substantially lower than the viscosity of the solutions obtained with the solvents used in the techniques of the prior art.

[0024] It has now been discovered that the abovementioned objectives can be achieved, in all or at least in part, by virtue of the solvent system of the present ~~invention~~disclosure. Yet other objectives which can be achieved by virtue of the subject-matters of the present ~~invention~~disclosure will become apparent in the description which follows.

[0024a] In a first aspect, there is provided the use of at least one solvent system for the dissolution of fluoropolymers, in particular poly(vinylidene fluoride), said solvent system comprising:

- from 50 to 99.9% by weight of a composition (A) comprising dimethyl sulphoxide (DMSO), and
- from 0.1 to 50% by weight of a composition (B) comprising at least one ketone.

[0024b] In a second aspect, there is provided a process for the dissolution of fluoropolymer, in particular poly(vinylidene fluoride), comprising at least the stage of bringing the said fluoropolymer into contact with at least one solvent system as defined above.

[0024c] In a third aspect, there is provided a solution comprising:

- from 1 to 50% by weight, preferably from 1 to 40% by weight and more preferably from 1 to 25% by weight of at least one fluoropolymer, preferably at least one poly(vinylidene fluoride), and

- from 50 to 99% by weight, preferably from 60 to 99% by weight and more preferably from 75 to 99% by weight of at least one solvent system as defined above.

[0024d] In a fourth aspect, there is provided the use of a solution as defined above, in the manufacture of films, membranes and coatings and in the manufacture of batteries.

Detailed Description of Embodiments

[0025] According to a first aspect, the present invention relates to a DMSO-based solvent system which makes it possible to dissolve fluoropolymers without having to heat at high temperatures, to obtain solutions for which the viscosities are lower than those obtained with DMSO alone, and to obtain solutions of fluoropolymers which are much more stable over time than with DMSO and comparable to NMP. Another advantage of the solvent system according to the invention is that it confers, on the solutions of fluoropolymers, a lower crystallization point than that of pure DMSO, that is to say of less than approximately 18°C.

[0026] More specifically, the present invention relates to a solvent system for fluoropolymer comprising:

- from 50 to 99.9% by weight of a composition (A) comprising dimethyl sulphoxide (DMSO), and