

CLAIMS

1. An aqueous formulation comprising a structural protein and an alcohol, having a clear appearance and wherein the structural protein has a molecular weight of between 20 kDa and 140 kDa, wherein the structural protein is a self-assembling silk protein comprising at least two identical repetitive units, wherein the alcohol is selected from the group consisting of ethanol, methanol, and isopropanol, wherein the formulation is a hydrogel and wherein said formulation comprises between 60 wt% and 90 wt% alcohol, between 0.05 wt% and 5 wt% a structural protein, and between 5 wt% and 39.95 wt% water,

and wherein said formulation comprises
between 60 wt% and 80 wt% alcohol,
between 0.75 wt% and 2 wt% of a structural protein, and
between 18 wt% and 39.25 wt% water.
2. The aqueous formulation of claim 1, wherein the structural protein has a molecular weight of between 20 kDa and 95 kDa or between 30 kDa and 75 kDa, and more preferably of between 40 kDa and 55 kDa.
3. The aqueous formulation of any one of claims 1 to 2, wherein said formulation has a complex viscosity of between 0.04 Pa·s and 30 Pa·s, preferably of between 0.2 Pa·s and 30 Pa·s, and more preferably of between 0.8 Pa·s and 15 Pa·s.
4. The aqueous formulation of any one of claims 1 to 3, wherein the silk protein is a recombinant silk protein.
5. The aqueous formulation of any one of claims 1 to 4, wherein the repetitive units are independently selected from the group consisting of module C having the sequence according to SEQ ID NO: 1 or a variant thereof, and module C^{Cys} having the sequence according to SEQ ID NO: 2 or a variant thereof, the module C variants each having a degree of sequence identity of at least 50%, preferably of 74% or more preferably of 86% to its respective reference module from which it is derived.

6. The aqueous formulation of any one of claims 1 to 5, wherein said formulation, further comprises a compound, wherein the compound is poorly water soluble, water insoluble, lipophilic, or oily, and wherein the compound is preferably selected from the group consisting of a pharmaceutical compound, a detergent compound, a cosmetic compound, a chemical compound, and a coloring compound.

7. A method for producing an aqueous formulation comprising a structural protein and an alcohol, the method comprising the steps of:
 - (i) providing an aqueous solution comprising the structural protein and an aqueous solution comprising the alcohol,
 - (ii) adding the aqueous solution comprising an alcohol to the aqueous solution comprising a structural protein, in particular by pouring, titrating, or dripping,
and
 - (iii) mixing the aqueous solutions, thereby obtaining the aqueous formulation comprising the structural protein and the alcohol,

wherein the structural protein has a molecular weight of between 20 kDa and 140 kDa, wherein the structural protein is a self-assembling silk protein comprising at least two identical repetitive units, wherein the alcohol is selected from the group consisting of ethanol, methanol, and isopropanol, and wherein said formulation comprises between 50 wt% and 90 wt% an alcohol and between 0.05 wt% and 5 wt% of a structural protein.

8. A method for producing an aqueous formulation comprising a structural protein and an alcohol, the method comprising the steps of:
 - (i) providing an aqueous solution comprising the structural protein and an aqueous solution comprising the alcohol,
 - (ii) (simultaneously) bringing together/combining the aqueous solution comprising the alcohol and the aqueous solution comprising the structural protein, and
 - (iii) mixing the aqueous solutions, thereby obtaining the aqueous formulation comprising the structural protein and the alcohol,

wherein the structural protein has a molecular weight of between 20 kDa and 140 kDa, wherein the structural protein is a self-assembling silk protein comprising at least two identical repetitive units, wherein the alcohol is selected from the group consisting of ethanol, methanol, and isopropanol, and wherein said formulation comprises between 50 wt% and 90 wt% an alcohol and between 0.05 wt% and 5 wt% of a structural protein.

9. A method for producing an aqueous formulation comprising a structural protein and an alcohol, the method comprising the steps of:

- (i) providing an aqueous solution comprising the structural protein and an aqueous solution comprising the alcohol,
- (ii) undercoating/underlayering the aqueous solution comprising the alcohol with/by the aqueous solution comprising the structural protein, and
- (iii) mixing the aqueous solutions, thereby obtaining the aqueous formulation comprising the structural protein and the alcohol,

wherein the structural protein has a molecular weight of between 20 kDa and 140 kDa, wherein the structural protein is a self-assembling silk protein comprising at least two identical repetitive units, wherein the alcohol is selected from the group consisting of ethanol, methanol, and isopropanol, and wherein said formulation comprises between 50 wt% and 90 wt% an alcohol and between 0.05 wt% and 5 wt% of a structural protein.

~~8~~10. The method of any one of claims 7 to 9, wherein said aqueous formulation is a hydrogel.

~~9~~11. The method of any one of claims 7 ~~or 8~~ to 10, wherein the mixing is performed by avoiding the application of shear forces, preferably by (gently) agitating, swiveling.

~~10~~12. The method of any one of claims 7 to ~~9~~11, wherein the aqueous formulation of any one of claims 1 to ~~7~~6 is formed.

~~11~~13. The method of any one of claims 7 to ~~10~~12, wherein the method further comprises the step of adding a compound to
the aqueous solution comprising the structural protein provided in step (i),
the aqueous solution comprising the alcohol provided in step (i), and/or
the mixture obtained in step (iii),
wherein the compound is poorly water soluble, water insoluble, lipophilic, or oily, and
wherein the compound is preferably selected from the group consisting of a pharmaceutical compound, a detergent compound, a cosmetic compound, a chemical compound, and a coloring compound.

~~12~~14. A method for producing an article comprising the steps of:

- (i) providing an aqueous formulation comprising a structural protein and an alcohol according to any one of claims 1 to ~~7-6~~or 10, and
- (ii) forming an article out of/from the formulation provided in (i).

~~13~~15. The method of ~~claims 7 to 10 and 12~~claim 14, wherein the method further comprises the step of adding a compound to the aqueous formulation provided in step (i) or to the article formed in step (ii), ~~and the method of claims 7 to 10 and 12~~ wherein said compound is poorly water soluble, water insoluble, lipophilic, or oily, and wherein said compound is preferably selected from the group consisting of a pharmaceutical compound, a detergent compound, a cosmetic compound, a chemical compound, and a coloring compound.

~~14~~16. An article obtainable by the method of claim ~~12-14~~or 1315.

~~15~~17. A cosmetic or pharmaceutical composition comprising the aqueous formulation comprising a structural protein and an alcohol according to claims 1 to ~~7~~6, or the article according to claim ~~14~~16.

~~16~~18. Use of the aqueous formulation comprising a structural protein and an alcohol according to claims 1 to ~~7~~6, or the article according to claim ~~14~~16 for the protection of a compound, for sustained or controlled release of a compound, for prolongation of the retention time of a compound, or for the formulation of a poorly water soluble, a water insoluble, a lipophilic, or an oily compound, wherein the compound is selected from the group consisting of a pharmaceutical compound, a detergent compound, a cosmetic compound, a chemical compound, and a coloring compound.