Claims

1. A method for producing a particle comprising a polymer matrix and a protein comprising the steps of:

   a) solidifying the protein from a solution comprising the protein,

   b) combining the solidified protein with a solvent comprising the polymer matrix,

   c) combining the solvent comprising the polymer matrix and the protein with an emulsifier in water,

   d) agitating the solvent comprising the polymer matrix, the protein and the emulsifier to form an emulsion,

   e) combining the emulsion comprising the polymer matrix and the protein with water to allow particles to form, and

   f) recovering the particles;

   wherein the protein is an antibody and wherein the polymer is a copolymer of mixed D,L-lactic acid and glycolic acid or a copolymer of L-lactic acid and glycolic acid.

2. The method according to claim 1, wherein the ratio of D,L-lactic acid or L-lactic acid to glycolic acid in the copolymer is 75:25.

3. The method according to any one of claims 1 to 2, wherein the solvent is ethyl acetate.

4. The method according to any one of claims 1 to 3, wherein the solvent comprises the polymer matrix at a concentration of 1% to 20% weight per volume.

5. The method according to any one of claims 1 to 4, wherein the emulsifier is polyvinyl alcohol.

6. The method according to any one of claims 1 to 5, wherein the emulsifier is at a concentration of 0.05% to 3.0% weight per volume in the water.

7. The method according to any one of claims 1 to 6, wherein the volume of the water is volume ratio organic solvent:water 1:26 to 1:100.

8. The method according to any one of claims 1 to 7, wherein the agitation to form an emulsion is performed by stirring at 3400 rpm to 13500 rpm.

9. The method according to any one of claims 1 to 8, wherein the agitation to extract solvent is performed for at least 30 minutes.

10. The method according to any one of claims 1 to 9, wherein the particles are recovered by filtration.

11. The method according to any one of claims 1 to 10, wherein the particles are dried under vacuum for at least 1 hour following recovery or by freeze-drying.