was dissolved above a critical concentration in a solvent or in a mixture comprising a solvent. From this solution, continuous, strong, cotton-like fibers, highly suitable for use in textiles, were spun and used.

Information regarding preparation of various derivatives of poly alpha-1,3-glucan and their application is sparse.

Yui et al. (*Int. J. Biol. Macromol.* 14:87-96, 1992) disclose using poly alpha-1,3-glucan extracted from the fruiting body of the fungus, *Laetiporus silphureus*, to synthesize poly alpha-1,3-glucan triacetate. The structure of this polymer was analyzed by X-ray crystallography.

Ogawa et al. (*Carb. Poly.* 3:287-297, 1983) used three different samples of poly alpha-1,3-glucan to prepare poly alpha-1,3-glucan triacetate. One sample was isolated from a bacterial extracellular polysaccharide, and the other two samples were extracted from fruiting bodies of fungi. The structures of these polymers were analyzed by X-ray crystallography.

Development of new poly alpha-1,3-glucan ester derivatives and methods of preparing such derivatives is desirable given their potential utility in various applications, such as film production.

SUMMARY OF INVENTION

The present invention is directed toward a film comprising poly alpha-1,3-glucan ester having at least one of: (a) a tear resistance of at least ~~about~~ 0.1 gf/mil; or (b) a haze of less than ~~about~~ 20%, wherein the poly alpha-1,3-glucan ester used is a mixed ester.

In another embodiment, the present invention is directed toward a method to prepare a poly alpha-1,3-glucan ester film comprising: (a) providing poly alpha-1,3-glucan mixed ester; (b) contacting the poly alpha-1,3-glucan ester of (a) with a solvent to make a solution of the poly alpha-1,3-glucan mixed ester; (c) applying the solution of the poly alpha-1,3-glucan mixed ester on a surface; and (d) allowing the solvent to evaporate to provide the poly alpha-1,3-glucan mixed ester film.

DETAILED DESCRIPTION OF INVENTION

The disclosures of all patent and non-patent literature cited herein are incorporated herein by reference in their entirety.

~~CLAIMS~~

~~What is claimed is:~~The Claims defining the invention are as follows:

1. A film comprising poly alpha-1,3-glucan ester having at least one of:

(a) a tear resistance of at least ~~about~~ 0.1 gf/mil; or

(b) a haze of less than ~~about~~ 20%;

wherein the poly alpha-1,3-glucan ester used is a mixed ester.

~~2. The film of claim 1, wherein the poly alpha-1,3-glucan ester used is poly alpha-1,3-glucan acetate.~~

2. The film of Claim 1, wherein the poly alpha-1,3-glucan ester comprises two or more of acetate, propionyl, butyryl, pentanoyl, hexanoyl, heptanoyl or octanoyl groups.

3. The film of ~~claim~~Claim 1, wherein the film has at least one of:

(a) a tear resistance from ~~about~~ 2.0 to ~~about~~ 2.4 gf/mil; or

(b) a haze of less than ~~about~~ 10%.

~~4. The film of claim 3, wherein the poly alpha-1,3-glucan ester used is poly alpha-1,3-glucan acetate~~

4. The film of Claim 3, wherein the poly alpha-1,3-glucan ester comprises two or more of acetate, propionyl, butyryl, pentanoyl, hexanoyl, heptanoyl or octanoyl groups.

5. A method to prepare a poly alpha-1,3-glucan ester film comprising:

(a) providing poly alpha-1,3-glucan mixed ester;

(b) contacting the poly alpha-1,3-glucan ester of (a) with a solvent to make a solution of the poly alpha-1,3-glucan mixed ester;

(c) applying the solution of the poly alpha-1,3-glucan mixed ester on a surface; and

(d) allowing the solvent to evaporate to provide the poly alpha-1,3-glucan mixed ester film.

~~6. The method of claim 5, wherein the poly alpha-1,3-glucan ester used is poly alpha-1,3-glucan acetate.~~

6. The method of Claim 5, wherein the poly alpha-1,3-glucan mixed ester comprises two or more of acetate, propionyl, butyryl, pentanoyl, hexanoyl, heptanoyl or octanoyl groups.

7. The method of ~~claim~~Claim 5, wherein the solvent is acetone.

8. The film of Claim 1 wherein the mixed ester comprises two or more of acetate, propionyl and butyryl groups.

9. A film comprising poly alpha-1,3-glucan ester having at least one of:

(a) a tear resistance of at least 0.1 gf/mil; or

(b) a haze of less than 20%;

wherein the degree of substitution is up to 2.80.