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ARTIFICIAL THREADS AND PROCESS OF PREPARING THEM

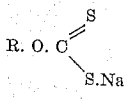
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11 Claims. (Cl. 18—54)

The present invention relates to artificial threads and a process of preparing them.

We have found that artificial threads having excellent properties can be made from viscose if to the solution of cellulose xanthate there is added before the spinning operation the solution of a xanthate of a higher aliphatic alcohol or a derivative thereof. Instead of the said xanthates there may also be used the solution of a xanthate of a partially substituted, water-insoluble derivative of a body of the type of the polyvinyl alcohol. These compounds have the following formula:



wherein R stands for an aliphatic radicle with at least 6 carbon atoms.

The xanthates used in accordance with the invention may be derived from fatty alcohols, for instance lauryl alcohol, stearyl alcohol or oleyl alcohol, or from monohydric, saturated or unsaturated alcohols obtainable by reduction of the corresponding fatty acids; from polyhydric alcohols which are obtainable, for instance by reduction of saturated or unsaturated hydroxy-fatty acids; or from hydroxy-fatty acids and the esters thereof. As an example there may be mentioned the mixture of primary alcohols (C_8 to C_{18}) obtainable by reduction of fatty acids or palm nut oil, the octodecane-diol obtainable by reduction of ricinoleic acid.

As partially substituted water-insoluble derivatives of bodies of the type of polyvinyl alcohol whose xanthates find application in the present invention there may be named the partially esterified water-insoluble polyvinyl alcohols, such as polyvinyl alcohol acetates, polyvinyl alcohol butyrates, polyvinyl alcohol oleates, partially etherified water-insoluble polyvinyl alcohols, partially acetalisated, water-insoluble derivatives of the polyvinyl alcohol, such as for instance the water-insoluble polyvinyl formal.

Owing to the presence of free hydroxyl groups the said products are capable of forming xanthates which are soluble in alkaline solutions. The alkaline solutions of said xanthates may be mixed with the alkaline solutions of the cellulose xanthates in any desired proportion. By spinning the mixtures in acid precipitating baths, the cellulose xanthates and the added xanthates are decomposed with regeneration of cellulose on the one hand and of the water-insoluble substances whose xanthates were added to the cellulose xanthate on the other hand.

There are thus produced threads which are distinguished by particular properties. The new artificial threads possess a greatly improved softness and suppleness, a considerably increased resistance to water and unaltered mechanical properties. The quantity and nature of the bodies to be added may be varied within wide limits.

The following examples serve to illustrate the invention, but they are not intended to limit it thereto, the parts being by weight:

(1) 10 parts of the oleyl alcohol are converted in known manner into the oleyl xanthate and the solution of the xanthate is standardized to 10 per cent. of oleyl alcohol. This solution is homogeneously mixed with 4000 parts of a viscose solution containing 5 per cent. of cellulose and the mixture is spun in known manner into artificial silk. The threads obtained are distinguished by a fine dull lustre and by an extraordinary softness and suppleness.

(2) A mixture of 5 parts of octodecane-diol prepared by reduction of ricinoleic acid in the form of its xanthate and 4000 parts of viscose (5 per cent. of cellulose) is spun as described in Example 1. A thread is obtained which is resistant to water and soft.

(3) 20 parts of the mixture of primary alcohols of C_8 to C_{18} obtained by reduction of fatty acids of palm nut oil are transformed into the xanthates and the solution of xanthates is standardized to a content of the alcohols of 10 per cent. This solution is homogeneously mixed with 4000 parts of a viscose solution containing 5 per cent. of cellulose and the mixtnre is spun in known manner. The threads obtained are considerably more resistant to water than ordinary viscose silk and possess an especially permanent softness.

(4) 10 parts of castor oil are converted into a solution of xanthate which contains about 5 per cent. of alcohol. This solution is homogeneously mixed with 4000 parts of a viscose solution containing about 5 per cent. of cellulose and the mixture is spun in one of the known strongly acid precipitating baths. A thread is obtained which shows a scrooping effect particularly resistant towards washing.

(5) 20 parts of a polyvinyl formal insoluble in water, but soluble in organic solvents are mixed with 50 parts of caustic soda solution of 40 per cent. strength and treated with 40 parts of carbon disulphide until the carbon disulphide is consumed. The solution is homogeneously mixed with 4000 parts of a solution of cellulose xanthate of 5 per cent. strength and the mixture is spun in an unripened or in a ripened

condition according to one of the usual methods of spinning viscose. An artificial thread is obtained which in comparison with an artificial thread from pure cellulose has a considerably increased resistance to water.

(6) A xanthate is prepared according to Example 5 from a polyvinyl acetate which has been saponified to such a degree that it is still insoluble in water. A quantity of xanthate solution corresponding to 20 parts of partially saponified polyvinyl acetate is homogeneously mixed with 4500 parts of a solution of cellulose xanthate containing 5 per cent. of cellulose and worked up in known manner into artificial threads.

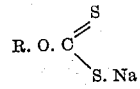
(7) 30 parts of a polyvinyl alcohol esterified with oleic acid and containing 1 molecular proportion of oleic acid for every 10 molecular proportions of vinyl alcohol are transformed into the xanthate as described in Example 5, to produce a solution of xanthate containing about 5 per cent. of polyvinyl alcohol oleate. The solution is mixed with 3500 parts of a solution of cellulose xanthate and spun according to one of the known processes.

A thread is produced which is completely resistant to water and has an extraordinary softness.

In the following claims there is to be understood by the term "fatty alcohols" besides lauryl, stearyl and oleyl alcohol, the monohydric, saturated or unsaturated alcohols which are produced by reduction of the corresponding fatty acids.

We claim:

1. A process of preparing artificial threads which comprises spinning into an acid precipitating bath a solution of cellulose xanthate containing a xanthate of the following general formula:



wherein R stands for an aliphatic radical with at least 6 carbon atoms.

2. A process of preparing artificial threads which comprises spinning into an acid precipitating bath a solution of cellulose xanthate containing a xanthate of a fatty alcohol with at least 6 carbon atoms.

3. A process of preparing artificial threads which comprises spinning into an acid precipitating bath a solution of cellulose xanthate containing the xanthate of oleyl alcohol.

4. A process of preparing artificial threads which comprises spinning into an acid precipitating bath a solution of cellulose xanthate containing the xanthate of octodecane-diol.

5. A process of preparing artificial threads which comprises spinning into an acid precipitating bath a solution of cellulose xanthate containing the xanthate of the mixture of alcohols prepared by reduction of the fatty acids of palm nut oil.

6. A process of preparing artificial threads which comprises spinning a solution of cellulose xanthate containing a xanthate of a water insoluble fatty alcohol into an acid precipitating bath.

7. As a new article of manufacture viscose threads containing oleyl alcohol and obtained by the process according to claim 3, said threads being homogeneously impregnated throughout by the alcohol.

8. As a new article of manufacture viscose threads containing octodecane-diol and obtained by the process according to claim 4, said threads being homogeneously impregnated throughout by the alcohol.

9. As a new article of manufacture viscose threads containing the mixture of alcohols prepared by reduction of the fatty acids of palm nut oil and obtained by the process according to claim 5, said threads being homogeneously impregnated throughout by the alcohols.

10. Viscose silk threads impregnated with a water-insoluble fatty alcohol and obtained by the process according to claim 6, said threads being homogeneously impregnated throughout by the alcohol.

11. As a new article of manufacture viscose threads containing a water-insoluble compound of the following formula:

R.OH

wherein R stands for an aliphatic radical with at least 6 carbon atoms, said compound being homogeneously distributed throughout the threads.

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