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TOBACCO PRODUCT

James Douglas Grossman, Richmond, and Abraham Bavley, Bon Air, Va., assignors to Philip Morris Incorporated, New York, N.Y., a corporation of Virginia

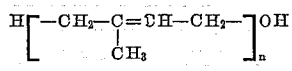
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8 Claims. (Cl. 131—17)

This invention relates to an improved tobacco product and, more particularly, relates to improved reconstituted tobacco products.

The product known as reconstituted tobacco has been made in recent years by a number of different methods in an effort to use tobacco parts which had formerly been regarded as waste materials. These methods have made it possible to produce smoking products from tobacco fines resulting from the manufacturing processes and from ground tobacco stems as well as from the tobacco leaves. However, smoking products made from reconstituted tobacco wastes have generally been less desirable than products made from the tobacco leaves themselves. In general, the side stream smoke from such reconstituted tobacco products has had a less desirable odor and the main stream smoke has been found to be less pleasant and less mild than the regular tobacco products and to lack the characteristic smoke flavor of tobacco.

We have discovered that such reconstituted tobacco products, and particularly those products in which the major portion of the tobacco comprises tobacco stems, to be greatly improved by the addition thereto of certain polyisoprenoid primary alcohols. These alcohols upon pyrolysis, reduce side-stream odors, result in a milder main-stream smoke and impart a desirable flavor note to the tobacco smoke.

The polyisoprenoid alcohols of the present invention have the formula:



where n has a value of from 3 to 9, inclusive.

Some of these alcohols, such as solanesol and farnesol, occur naturally in nature and all of these alcohols can be prepared by the method of Ruzicka, L., and Firmenich, G. Helv. Chim. Acta 22 392–6.

These alcohols may be present in the tobacco product as such or may be present in the form of an ester in which the terminal hydroxyl group contains in place of the hydrogen in the hydroxyl group, an aliphatic or aromatic organic radical, such as an alkyl radical, a phenyl radical or the like. In the practice of the present invention, such esters are equivalent to the alcohols set forth in the above formula.

One or more of the polyisoprenoid alcohols can be applied to any tobacco product to enhance its properties but are most advantageously employed in reconstituted tobacco. They can be applied to the tobacco, for example to the reconstituted tobacco parts, by any conventional method of application, including streaking, spraying, dipping and the like. The polyisoprenoid alcohols can be applied to the shredded filler made from reconstituted tobacco by spraying or by mechanical mixing. Alternatively, the alcohols can be streaked on the paper sleeve of a cigraette product to provide the desirable results which can be obtained in accordance with the present invention.

The polyisoprenoid alcohols of the present invention are added to the tobacco product in an amount such that they comprise from 0.1 to 10.0% by weight and preferably from 0.1 to 5.0% by weight based upon the weight of the tobacco. The exact amount employed will vary on the quality of the reconstituted tobacco or other tobacco which is employed and on the particular method used to apply the alcohol to the tobacco.

Upon pyrolysis of the tobacco, products containing these materials, whether or not admixed with or as a coating on the tobacco itself or as a coating or incorporated within the wrapper of the tobacco product, yield pyrolysis products including isoprene, monoterpenoids, such as dipentene, and other isoprenoid products, having a high flavor index. Such products increase the flavor and aroma of the smoke, giving it flowery, lemon-like and sandalwood-like notes, depending upon the particular isoprenoid alcohol which is employed. In addition to imparting desirable flavor notes to the smoke, the polyisoprenoid alcohols also mask undesirable odors which are created upon pyrolysis of the tobacco products.

The following examples are illustrative:

Example 1

Reconstituted tobacco sheet was shredded and divided into two 1000-gram lots. Five grams of farnesol was sprayed on one of the 1000-gram portions and mixed thoroughly to give a homogeneous distribution of the farnesol in the tobacco. The resulting mixture was used to prepare cigarettes. Control cigarettes were made from the other 1000-gram batch of shredded material.

Subjective evaluation of the experimental and the control cigarettes by a smoking panel of forty members showed that the weak odor of angelica seed or of the linden tree blossoms which is characteristic of farnesol was not detectable in the smoke. The side-stream smoke of the experimental cigarette imparted to the atmosphere of the smoking room a pleasant citrus-type odor with a flowery rose-like undertone. The flavor of the main-stream smoke was greatly enhanced by a note similar to that of lemon oil. The harshness characteristic of the smoke of the control was greatly reduced.

To identify the substances into which farnesol had been fragmented by pyrolysis, 10 grams of farnesol was passed through a pyrolysis tube under nitrogen at various temperatures ranging from 500 to 800° C. The pyrolysis products were collected in Dry Ice and liquid nitrogen traps and analyzed mass spectrometrically. The analyses revealed the presence of isoprene, dipentene, other $C_{10}H_{16}$ isomers, $C_{10}H_{14}$ compounds, and $C_{10}H_{18}$ compounds as well as $C_{15}H_{24}$ compounds.

The total pyrolysis product was separated on a silica gel column into a hydrocarbon and an oxygenated fraction. The yield was approximately 10–25% for the hydrocarbon fraction and was approximately 15–25% for the oxygenated fraction, depending upon the temperatures under which pyrolysis took place.

Gas chromatographic analyses of the hydrocarbon portion separated it into four fractions. The dipentene was identified by comparison with the infra red spectrum of authentic dipentene. Gas chromatography of the oxygenated fraction showed that it was a complex mixture of many compounds which had strong and dissimilar aromas. This was established by sampling the gas chromatographic column for flavor at each peak occurrence.

Example 2

Farnesol was added to reconstituted tobacco filler as in Example 1 in amounts varying from 0.1 to 5.0%, based upon the weight of the filler. Subjective comparisons by a panel of forty members of the smoke from the experimental cigarettes and that from the control cigarettes showed that the same improvements described in Example 1 were accomplished by the use of farnesol as an additive. The detectability of the improvements was increased as the amount of farnesol was increased.

Example 3

Ten grams of solanesol, which has no odor, was dissolved in 100 ml. petroleum ether, and applied by the use of spray techniques to 1000 grams of reconstituted tobacco sheet. The treated sheet was dried with a heat source to evaporate the solvent. It was then shredded and converted into cigarettes. A control cigarette was prepared by using filler made from an untreated reconstituted tobacco sheet. The cigarettes were smoked by a smoking panel of forty members.

Subjective evaluation of the smoke from the experimental and control cigarettes revealed that solanesol as an additive altered the odor of the side-stream smoke, imparting a distinct sandalwood odor to the atmosphere. The flavor and aroma of the main-stream smoke was enhanced by a citrus-like flavor which had a jasmine-like undertone. The harshness which is characteristic of the smoke of untreated reconstituted tobacco products was greatly reduced.

To identify the substances into which solanesol had been fragmented by pyrolysis, 10 grams of pure solanesol was pyrolyzed and analyzed as was farnesol in Example 1. The yield of the monoterpenoids, of which dipentene was the major constituent, was about 10–40%. The yield of the oxygenated products was around 15–20%, depending upon the temperature under which the pyrolysis was conducted. As in Example 1, it was established that these fractions had strong and dissimilar odors.

Example 4

Liquid farnesol was streaked on the paper wrapper of a standard cigarette which had been made with shredded filler prepared from a reconstituted tobacco sheet. The application was made at the 0.1–5.0% levels.

The treated cigarettes and a control were smoked and evaluated subjectively by a smoking panel of forty members. The improvements were identical with those given in Example 1.

Example 5

Geranylgeraniol, which is a polyisoprenoid primary alcohol with four isoprene units, was prepared according to the method of Ruzicka set forth above. The compound had no odor. When pyrolyzed and analyzed according to the methods given for the pyrolysis and analysis of solanesol in Example 1, the same general fragmentation was observed.

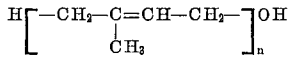
Ten grams of geranylgeraniol were added to 1500 grams of cigarette filler made from reconstituted tobacco

sheet and mixed thoroughly with the shredded tobacco. Cigarettes were prepared from the treated filler and from untreated filler.

Subjective evaluation by a smoking panel of forty members showed that the smoke from the experimental cigarettes had more desirable smoke and flavor characteristics than did that from the control. The objectionable odor from the side-stream smoke of the control was not detectable; the odor and taste of the main-stream smoke was flowery and pleasant; the smoke was more mild than that from the control.

We claim:

1. A tobacco product containing tobacco and from about 0.5 to about 5.0% by weight, based on the tobacco, of a polyisoprenoid alcohol having the formula:



where n has a value of from 3 to 9, inclusive.

2. The tobacco product of claim 1 wherein the polyisoprenoid alcohol is solanesol.

3. The tobacco product of claim 1 wherein the polyisoprenoid alcohol is farnesol.

4. The tobacco product of claim 1 wherein the polyisoprenoid alcohol is geranylgeraniol.

5. The tobacco product of claim 1 in which the major portion of the tobacco comprises tobacco stems.

6. The tobacco product of claim 5 wherein the polyisoprenoid alcohol is solanesol.

7. The tobacco product of claim 5 wherein the polyisoprenoid alcohol is farnesol.

8. The tobacco product of claim 5 wherein the polyisoprenoid alcohol is geranylgeraniol.

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