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EXTRACTION OF TOBACCO WITH FLUORO-CHLOROHYDROCARBONS

William W. Rhodes, Philadelphia, Pa., assignor. by mesne assignments, to Kinetic Chemicals, Inc., a corporation of Delaware

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4 Claims. (Cl. 131-143)

This invention relates to the treatment of tobacco, more particularly it relates to the improvement of tobacco by solvent extraction of undesirable components.

This invention has for an object the improvement of tobacco by extraction of undesirable impurities. A further object is the extraction of undesirable constituents from tobacco without impairing the desirable properties of the same. 10 A still further object is to reduce the fire and health hazards encountered in the solvent extraction of tobacco. Other objects will appear hereinafter.

The above and other objects are accomplished 15 by the following invention which comprises treating tobacco with a solvent which has a preferential action upon the tarry constituents. More particularly these objects are accomplished by extracting tobacco in the form of leaves or 20 in any other physical state in which it may exist such as after grinding or other processing with an aliphatic fluorochlorohydrocarbon solvent. The fluorochlorohydrocarbons used are preferably those which have relatively low boiling 25 points, for example, below 100° C.

The invention will be further understood but is not intended to be limited by the following examples:

Example I

One hundred pounds of leaf tobacco was extracted in a large vessel at a temperature of 20° C. with monofluorotrichloromethane. The solvent was found to contain a high amount of tarry matter and a relatively small amount of nicotine. The resulting tobacco after complete removal of the solvent was good in appearance and had excellent smoking properties.

Example II

One hundred pounds of shredded tobacco was countercurrently extracted at a temperature of 20° C. with monofluorodichloromethane under pressure. The solvent was found upon subsequent treatment to contain a large amount of 45 tarry matter and minor amounts of nicotine. The tobacco was of good flavor, odor and appearance and had good smoking characteristics.

Other fluorochloro-aliphatic hydrocarbons can be substituted for the specific ones described in 50 the preceding examples with equally good results. Among the useful compounds are

 $C_2H_3ClF_2$ C2HCIF4 CHClF2 C2H3Cl2F C2HCl3F2 C2H2Cl2F2 CH2ClF C₂Cl₃F₃ C₂H₂ClF₃ C2HCl2F3

The fluoro-chloro-methanes of the above list represent the preferred compounds and of these I prefer the monofluorochloromethanes.

The selective action of these compounds as to tarry matter is illustrated by the following table: 5

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Compound	Percent tarry matter removed,	Percent nicotine removed,	Ratio of tars to nicotine	10
	A	В		10
			16	
CCl ₂ F	4.9 2.9	0.3 0.1	16 29	
C2Cl2F4	2.8 5.7	0.2	14 19	2 10
CHCl ₂ F Methyl chloride	6.6	1.5	4.4	15

The extraction can be performed on dry or moist tobacco, or it can be performed upon tobacco which has been treated with other agents. The extraction can furthermore be performed at 20 different stages of the preparation of the tobacco for use. The following example illustrates the extraction of tobacco which has been pretreated with ammonia:

Example III

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One hundred pounds of uncured leaf tobacco was moistened with dilute ammonia solution (about 0.5% ammonia) and extracted in this condition with 200# of CCl2F2. This treatment 30 removed about 30% of the tarry matter and over 55% of the nicotine originally in the tobacco.

The separation of the solvent from the extracted material may be accomplished by simple distillation. The residual solvent may be re- 35 moved from the tobacco by passing air or other inert gases over the treated tobacco or by a simple warming of the treated mass to volatilize the

The quantity of solvent which will be used de- 40 pends largely upon the results desired. If a maximum removal of tar is desired it will be preferable to use a larger quantity of solvent or to treat the same in a countercurrent system. The results reported in the above table were obtained with a solvent tobacco ratio of 10 to 1 but this ratio is merely illustrative of the process and not a limitation.

The temperature to be used may vary over a wide range and depends upon not only the sol- 50 vent chosen but the pressure employed. Thus the extraction may be carried out between -40and $+100^{\circ}$ C. and preferably between -10 and +50° C. The particular temperature chosen depends upon the particular solvent used and the 55 amount of tarry matter which is contained in the tobacco to be processed. The pressure at which the extraction is carried out will depend entirely on the solvent and temperature at which the extraction is performed. As a general rule the pressure should at least be sufficient to keep the solvent in the liquid state. For example, if CF₂Cl₂ is used as the solvent at a temperature of 30° C., the pressure will be about 93 pounds 10 per square inch gauge, while if C₂F₄Cl₂ is used at this temperature the pressure necessary will be only about 22 pounds per square inch gauge.

This invention presents the advantage that fire and health hazards which are encountered by the use of lower alkyl chlorides are eliminated. A further advantage resides in the fact that the solvent may be quickly removed from the tobacco at low temperatures, thus obviating the higher temperatures necessary with other solvents. Since overheating of tobacco is very deleterious, this advantage is of considerable importance. A still further advantage is the preferential solvent action exhibited by these solvents on the undesirable tarry matter found in tobacco. Other advantages reside in the combi-

nation of non-inflammability, low boiling point, non-toxicity, non-corrosiveness to equipment, and good solvent action on tars.

As many apparently widely different embodiments of this invention may be made without 5 departing from the spirit and scope thereof, it is to be understood that we do not limit ourselves to the specific embodiments thereof except as defined by the appended claims.

I claim:

1. The process which consists of subjecting tobacco to a liquid phase extraction with a low-boiling halogenated solvent taken from the class consisting of the normally gaseous fluorochloromethanes.

2. The process which consists of subjecting tobacco to a liquid phase extraction with dichlorodiffuoromethane.

3. The process which consists of subjecting tobacco to a liquid phase extraction with di-20 chloromonofluoromethane.

4. The process which consists of subjecting tobacco to a liquid phase extraction with trichloromonofluoromethane.

WILLIAM W. RHODES.