

PATENT SPECIFICATION

NO DRAWINGS

Inventors: PETER WILLIAM DRAKE MITCHELL and JACK HERBERT BLUMENTHAL

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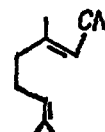
COMPLETE SPECIFICATION

Unsaturated Aliphatic Nitriles and their Preparation

We, INTERNATIONAL FLAVORS & FRAGRANCES INC., a Corporation organised under the laws of the State of New York, United States of America, of 521 West 57th Street, New York, State of New York, United States of America, do hereby declare the invention for which we pray that a patent may be granted to us and the method by which it is to be performed, to be particularly described in and by the following statement:—

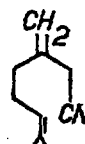
This invention relates to a novel process for the preparation of unsaturated octanenitriles. It relates also to perfume compositions containing effective amounts of one or more of these valuable compounds as olfactory ingredients.

More particularly, this invention relates to certain unsaturated aliphatic nitriles characterized by seven carbon atoms in a straight chain attached to the nitrile group, a methyl group on the number seven carbon atom, a methyl or methylene group on the number three carbon atom and at least one point of unsaturation in the said chain. The compounds are named as indicated below and may be represented by the following formulas:



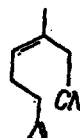
II

trans - 3, 7 - dimethyl - 2, 6 - octadiene- 30
nitrile



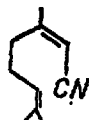
III

7 - methyl - 3 - methylene - 6 - octenenitrile

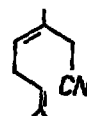


IV

3, 7 - dimethyl - 3, 7 - octadienenitrile 35



I

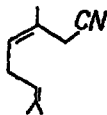


V

cis - 3, 7 - dimethyl - 2, 6 - octadienenitrile cis - 3, 7 - dimethyl - 3, 6 - octadienenitrile

[Price 5s. 0d.]

Price 2s.



VI

trans - 3, 7 - dimethyl - 3, 6 - octadiene-
nitrile

Compound I is also known as neronitrile
and Compound II is known as geranonitrile.
For convenience the above compounds will
occasionally be referred to hereinafter by
the above number designations.

Compounds III, IV, V and VI are new
compounds.

The compounds prepared in accordance
with the process of this invention are useful
as components of perfume compositions. The
perfume compositions may be used alone or
they may be blended into, for example,
soaps, detergents, space deodorants, e.g., space
sprays, and cosmetics to enhance their
acceptability. Individual compounds may be
isolated from the reaction mixture, but nor-
mally the compounds will be prepared and
utilized as a mixture in the preparation of
perfume compositions. It has not as yet
proved possible to separate the cis-trans
isomers of 3, 7 - dimethyl - 3, 6 - octadiene-
nitrile, i.e. compounds V and VI, one from
the other.

The term "perfume composition" is used
herein in the usual sense to mean a mixture
of organic compounds, including, for example,
alcohols, aldehydes, ketones, esters and, fre-
quently, hydrocarbons which are combined in
fixed proportions so that the combined odors
of the individual compounds produce a pleas-
ant fragrance. A perfume composition in
accordance with the present invention contains,
as an olfactory ingredient, a compound
selected from compounds III to VI and mix-
tures thereof. The composition may addition-
ally contain compound I or compound II or
mixtures thereof.

It is possible, and in many instances desir-
able to carry out the process of the invention
under conditions such that compounds III,
IV, V and VI predominate in the mixture or
such that compounds I and II predominate.
It will be noted that in compounds I and II
the double bond closest to the nitrile group
is actually conjugated with that group, and
that in compounds III, IV, V and VI no such
conjugation exists. For convenience, the
former group of compounds will be referred
to as conjugated nitriles, and the latter as
unconjugated nitriles.

In accordance with the process of this
invention, the above described compositions
are prepared by a condensation reaction be-
tween the known compounds cyanoacetic acid

and 2 - methyl - hept - 2 - ene - 5 - one
in the presence of an organic amine, or a
salt of the amine with a mineral or organic
carboxylic acid. Reaction is effected in an
organic solvent, preferably containing up to
nine carbon atoms, at an elevated tempera-
ture of from 40°C to 180°C. The preferred
range, from the point of view of completing
the reaction in a convenient time period while
obtaining good yields, is from 80°C to
140°C.

In the course of the reaction, water is split
out between the two reacting molecules. It
is most convenient to remove the water as it
forms, preferably by azeotropic distillation.
Accordingly, although a variety of organic
solvents, especially aromatic solvents such as
xylene and ethyl benzene can be employed,
it is preferred to use solvents such as benzene
and toluene which are relatively inexpensive
and form azeotropic mixtures with water
within the temperature range at which the
reaction is carried out.

The time of the reaction is not critical.
It depends principally upon the quantity of
reactants and the reaction temperature. It
is most convenient to follow the reaction by
removing water as it forms. When no further
water can be collected, the reaction may be
considered to be substantially complete.

Although equimolar quantities of reactants
may be employed, it is preferred to utilize
an excess of the cyanoacetic acid since this is
the less expensive of the two reagents. Nor-
mally, up to 50% molar excess of acid will be
used.

As aforesaid, it is possible by control of
the reaction conditions to predetermine
whether the mixture will contain a major
proportion of conjugated nitriles or a major
proportion of unconjugated nitriles. This result
may be effected by selection of the con-
densation catalyst or the amount of catalyst.
If an amine salt is used to catalyze the re-
action, or if less than an equimolar quantity
of amine, based on the amount of cyanoacetic
acid is used as a catalyst, the resulting com-
position will contain a major proportion of
unconjugated compounds. If the reaction is
carried out under alkaline conditions, i.e. with
a molar excess of amine based on the cyano-
acetic acid, the composition will contain a
major proportion of conjugated compounds.

Typical of the primary, secondary and
tertiary amines which can be used in the
process of the invention are piperidine,
pyridine, cyclohexyl amine, aniline, triethanol-
amine and paratoluidene. Organic and in-
organic acid salts of these amines, especially
mineral and organic, alkanolic, carboxylic acid
salts containing up to five carbon atoms in
the acid moiety, can be utilized. Triethanol-
amine, cyclohexylamine and ammonium
acetate are preferred catalysts because of
their relatively low cost.

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The following non-limiting examples illustrate the process of this invention. In Example I the composition produced contains a major proportion of unconjugated compounds. The composition of Example II contains mostly conjugated compounds.

EXAMPLE I

A stirred mixture of 68.1 kg. of 2 - methylhept - 2 - ene - 6 - one, 55.4 kg. of cyanoacetic acid, 94. kg. of toluene and 5.3 kg. of triethanolamine is heated to the reflux point during a period of two hours. The mixture is then refluxed for a period of 19 hours to collect an azeotropic mixture of toluene and water containing 7.9 liters of water. The reaction mixture is washed four times with an equal volume of brine. A total of 53.6 kg. of toluene is recovered at reduced pressure and the residue distilled at 2 mm. to give 54.6 kg. of crude product boiling at 40—150°C. This product is fractionated by distillation at 2 mm. of mercury pressure and at 9:1 reflux ratio to give 8.52 kg. of unreacted 2 - methylhept - 2 - ene - 6 - one at 36°C, and 15.9 kg. of the desired mixture boiling at 84°C. This mixture has the following physical properties: specific gravity 0.8765, n_D^{20} 1.4710. It is separated into its components by gas-liquid chromatography using helium as the gas and two five foot, one-quarter inch inside diameter tubes in tandem at 100°C and a flow rate of 80 ml. per minute. The absorbent in the first tube is 5% polyethylene glycol (Carbowax 20 M) and in the second 5% silicone rubber (SE 30 Gum Rubber). The word "Carbowax" is a Registered Trade Mark. The mixture contains about 6% of compound I, 27% of compound II, 27% of compound III, 2.6% of compound IV and 38% of a mixture of compounds V and VI. The compounds, except for compound IV are identified by nuclear magnetic resonance, mass spectrometry and infrared analysis. Compound IV is identified by its infrared and mass spectra.

The NMR characteristics of Compounds I, II, III, V and VI are as follows:

Compound I

Proton Type	Chemical Shift (ppm)
Olefinic protons	5.08 (m)
$=C-CH_2$	2.32 (t)
$CH_3-C=C-CN$	1.91 (d)
Allylic Methyls	1.48 (diffuse d)

Compound II

Olefinic protons	5.08 (m)
$=C-CH_2$	2.2 (diffuse)
$CH_3-C=C-CN$	2.05 (d)
Allylic Methyls	1.46 (d)

Compound III

$>C=CH_2$	4.7 (broad)
$=C-CH_2-C-N$	2.98 (broad s)
$=C-CH_2-$	2.22 (diffuse t)
Allylic Methyls	1.52 (broad s)

Compounds V and VI

Olefinic proton	5.4 (diffuse t).
Olefinic proton	5.03 (diffuse t)
$=C-CH_2-CH$	2.98 (broad s)
$=C-CH_2-C=$	2.70 (t)
Allylic Methyls	1.68 (at least 3 discrete signals)

The salient infrared characteristics of compound IV manifest the characteristics of an unconjugated nitrile at 4.44 μ and an isopropenyl moiety at 11.26 μ . The molecular weight by mass spectrophotograph is 149.

EXAMPLE II

A total of 15 moles of cyanoacetic acid followed by 10 moles of 2 - methyl - hept - 2 - ene - 5 - one is added to 400 mls. of dioxane while a slow stream of nitrogen is bubbled through the mixture. There is then added 15.8 moles of cyclohexylamine with stirring. There is an exothermic reaction, and the temperature is regulated externally so that it does not increase above 50°C during the addition which takes about 95 minutes. After all of the amine is added, stirring is continued while refluxing the mixture at 95°—100°C for 7 hours. The mixture is then cooled and washed as follows:

- (i) Twice with equal volumes of 10% brine
 - (ii) 10% sulfuric acid until the washings are acid
 - (iii) Again with brine to neutrality
- The washings are each extracted with 1/3 the volume of toluene and the combined organic layer and toluene extracts distilled to remove the solvent. The residue is further distilled to remove unreacted ketone and the product comprising a mixture of nitriles is taken off at a 1:1 reflux ratio. The mixture is separated into its components by gas-liquid chromatography using the procedure of Example I. The mixture from which the components are isolated contains 35% by weight of compound I, 60% of compound II and 5% of a mixture of compounds III, IV and V.

The mixtures obtained by the process of this invention or the components of the mixture may be utilized alone, for example, in sachets for use in bureaus and in closets, or they may be utilized as olfactory components in detergents, cosmetics, soaps, space deodorants (i.e. air or room deodorants or fresheners) and other formulations. When so used they contribute a fresh, citrusy, lemon-like odor similar to that obtained with citral. Mixtures containing a major proportion of

conjugated nitriles have a powerful, somewhat harsh aroma. Those with a major proportion of unconjugated nitriles have a softer, more delicate aroma.

In perfume compositions the individual component will contribute its particular olfactory characteristic, but the overall effect of the perfume composition will be the sum of the effect of each ingredient. Thus the individual compounds of this invention, or mixtures thereof may be used to alter the aroma characteristics of a perfume composition, for example, by highlighting or moderating the olfactory reaction contributed by another ingredient in the composition.

The following examples illustrate perfume mixtures, soap and other formulations within the scope of this invention. It is to be understood that these compositions are preferred examples, and the invention is not to be considered as restricted thereto except as indicated in the appended claims.

In the examples, the soap base and soap chips used are unperfumed sodium based toilet soaps made from tallow and coconut oil. The detergent powder is a powder obtained from Lever Bros. Co. and sold under the trademark RINSO. The liquid detergent is a product manufactured by Ultra Chemical Co., and is known as P-87 liquid detergent.

EXAMPLE III

Preparation of Soap Compositions

A total of 100 grams of soap chips are mixed with one gram of each of the perfume compositions given below until a substantially homogeneous composition is obtained. Both soap compositions manifest a characteristic lemon-like odor with the composition containing the mixture from Example II having the more delicate aroma at some sacrifice in strength.

The perfume compositions consist of the following ingredients in the parts by weight indicated:

45	Germanium bourbon	175
	Citronellol	150
	Geraniol	100
	Phenyl ethyl alcohol	90
	Amyl cinnamic aldehyde	200
50	Cyclamal	20
	Lylal*	100
	Tetrahydro linalool	37.5
	Tetrahydro myrcenol	37.5
	Linalool	75
55	Citronellyl acetate	125
	Phenyl ethyl acetate	5
	Phenyl acetaldehyde dimethyl acetal	10
	Cinnamic alcohol	35
	Terpinol	100
60	Linalyl acetate	25
	Musk ketone	10
	Indole	10
	Mixture from Example I or II	10

* Lylal is the Registered Trademark of International Flavors & Fragrances, Inc. for 4 - (4 - methyl, 4 - hydroxy amyl) Δ 3 - cyclohexene carboxaldehyde.

Similar results are obtained when the mixtures of Examples I and II are replaced with the components of the mixtures.

EXAMPLE IV

Preparation of Detergent Composition

A total of 100 grams of detergent powder are mixed with 0.15 grams of a perfume composition containing the mixture obtained in Example I until a substantially homogeneous composition having a lemon-like odor is obtained.

The perfume composition consisted of the following ingredients in parts by weight indicated:

Decyl aldehyde, 10% solution in diethyl phthalate	4
Terpinyl acetate	100
Terpineol	40
Linalool acetate	100
Orange Oil	350
Geranyl acetate	100
Geraniol	35
Coumarin	2
Mixture produced by procedure of Example I	70

A similar result is obtained by replacing mixture I with mixture II or its components.

EXAMPLE V

Preparation of Cosmetic Powder Composition

A cosmetic powder is prepared by mixing 100 grams of talcum powder with 0.25 grams of the mixture obtained in Example I in a ball mill. A second cosmetic powder is similarly prepared except that mixture produced by the procedure of Example I is replaced with the mixture from Example II. Both have a lemon-like odor.

EXAMPLE VI

Liquid Detergent containing

7 - methyl - 3 - methylene - 6 - octenenitrile Concentrated liquid detergents with a lemon-like odor are prepared containing 0.1%, 0.2% and 0.5% of 7 - methyl - 3 - methylene - 6 - octenenitrile and prepared by adding the appropriate quantity of the compound to the liquid detergent.

The amount of mixtures or compounds of this invention which will be effective in perfume compositions depends on many factors, including the other ingredients, their amounts and the effects which are desired. It has been found that perfume compositions containing as little as 0.02% by weight of mixtures or compounds of the invention, or even less may

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5 be usefully employed. For certain composi-
tions as much as 5% by weight or even higher
is useful. When used in soaps and other
products the amount of perfume composition
is the same as is generally employed with
ordinary compositions, i.e. from about 1%
to about 3% by weight. Thus, as little as
0.0002% by weight of a product or mixture
of products of this invention may be used
10 to impart a lemon-like odor to soaps,
cosmetics and other products.

EXAMPLE VII

15 A total of 93.5 g. (1.1 moles) of cyano-
acetic acid, 126 g. (1.0 mole) of 2 - methyl-
hept - 2 - ene - 6 - one and 3.85 g. (0.05
mole) of ammonium acetate in 100 mm. of
benzene are refluxed until approximately 18
mm. of water are removed. The mixture is
20 then washed 3 times with dilute hydrochloric
acid and the solvent removed by distillation
at about 40 mm. of mercury pressure. The
mixture is then heated to effect decarboxyla-
tion and the residue distilled at high vacuum.
25 The residue is separated into its components
by gas-liquid chromatography in accordance
with the procedure of Example I. The mix-
ture from which the components are isolated
contains 7.0% by weight of Compound I,
21.0% by weight of Compound II, 28.4% by
30 weight of Compound III and 38.5% by weight
of Compounds V and VI.

WHAT WE CLAIM IS:—

- 35 1. A mixture characterized by a lemon-
like aroma comprising the conjugated nitriles
cis - 3, 7 - dimethyl - 2, 6 - octadienenitrile
and trans - 3, 7 - dimethyl - 2, 6 - octadiene-
nitrile together with the unconjugated nitriles
7 - methyl - 3 - methylene - 6 - octenenitrile;
3, 7 - dimethyl - 3, 7 - octadienenitrile, cis-
40 3, 7 - dimethyl - 3, 6 - octadienenitrile and
trans - 3, 7 - dimethyl - 3, 6 - octadienenitrile.
2. A mixture according to Claim 1 con-
taining a major proportion of conjugated
nitriles.
45 3. A mixture according to Claim 1 con-
taining a major proportion of unconjugated
nitriles.
4. 7 - Methyl - 3 - methylene - 6 - octene-
nitrile.
50 5. 3, 7 - Dimethyl - 3, 7 - octadienenitrile.
6. 3, 7 - Dimethyl - 3, 6 - octadienenitrile.
7. A perfume composition containing as an
olfactory ingredient a compound of the group
consisting of 7 - methyl - 3 - methylene - 6 -
55 octenenitrile; 3, 7 - dimethyl - 3, 7 - octadi-
enenitrile; cis - 3, 7 - dimethyl - 3, 6 -
octadienenitrile; trans - 3, 7 - dimethyl - 3, 6 -
octadienenitrile, or mixtures thereof.
8. A composition according to Claim 7
60 additionally containing cis - or trans - 3, 7 -

dimethyl - 2, 6 - octadienenitrile or mixtures
thereof.

9. A composition according to Claim 7
or 8 in admixture with a soap, detergent,
cosmetic or space deodorant. 65

10. A perfume composition according to
Claim 7 substantially as described herein.

11. A process for the preparation of a
mixture containing the conjugated nitriles
cis - 3, 7 - dimethyl - 2, 6 - octadienenitrile
and trans - 3, 7 - dimethyl - 2, 6 - octadiene-
nitrile together with the unconjugated nitriles
7 - methyl - 3 - methylene - 6 - octene-
nitrile; 3, 7 - dimethyl - 3, 7 - octadiene-
nitrile, cis - 3, 7 - dimethyl - 3, 6 - octadiene-
nitrile and trans - 3, 7 - dimethyl - 3, 6 -
octadienenitrile, which comprises condensing
cyanoacetic acid with 2 - methyl - hept - 2 -
ene - 5 - one in the presence of an amino
compound, or a salt thereof with a mineral
or an organic carboxylic acid, the reaction
being carried out in an organic solvent and
at a temperature of from 40°C. to 180°C. 70

12. A process according to Claim 11 where-
in a salt or up to an equimolar quantity of
amino compound based on the amount of
cyanoacetic acid is employed and the mixture
contains a major proportion of unconjugated
nitriles. 75

13. A process according to Claim 11 90
wherein more than an equimolar quantity
of amino compound based on the amount of
cyanoacetic acid used is employed and the
mixture contains a major proportion of
conjugated nitriles. 95

14. A process according to Claim 11
or 12 wherein the catalyst is ammonium
acetate.

15. A process according to Claim 11
or 13 wherein the catalyst is triethanolamine
or cyclohexylamine. 100

16. A process, in accordance with Claim
11, for the preparation of a mixture con-
taining the conjugated nitriles cis- and trans-
3, 7 - dimethyl - 2, 6 - octadienenitrile
together with the unconjugated nitriles 7-
methyl - 3 - methylene - 6 - octenenitrile
3, 7 - dimethyl - 3, 7 - octadienenitrile, cis
3, 7 - dimethyl - 3, 6 - octadienenitrile and
trans - 3, 7 - dimethyl - 3, 6 - octadiene-
nitrile, substantially as described herein. 105

17. A mixture containing the conjugated
nitriles cis - 3, 7 - dimethyl - 2, 6 - octadiene-
nitrile and trans - 3, 7 - dimethyl - 2, 6 -
octadienenitrile together with the uncon-
jugated nitriles 7 - methyl - 3 - methylene-
6 - octenenitrile; 3 7 - dimethyl - 3, 7 -
octadienenitrile, cis - 3, 7 - dimethyl - 3, 6 -
octadienenitrile and trans - 3, 7 - dimethyl-
3, 6 - octadienenitrile, whenever prepared
120 by a process according to any one of Claims
11 to 16.

18. A mixture containing nitriles substanti-

be usefully employed. For certain compositions as much as 5% by weight or even higher is useful. When used in soaps and other products the amount of perfume composition is the same as is generally employed with ordinary compositions, i.e. from about 1% to about 3% by weight. Thus, as little as 0.0002% by weight of a product or mixture of products of this invention may be used to impart a lemon-like odor to soaps, cosmetics and other products.

EXAMPLE VII

A total of 93.5 g. (1.1 moles) of cyanoacetic acid, 126 g. (1.0 mole) of 2 - methylhept - 2 - ene - 6 - one and 3.85 g. (0.05 mole) of ammonium acetate in 100 mm. of benzene are refluxed until approximately 18 mm. of water are removed. The mixture is then washed 3 times with dilute hydrochloric acid and the solvent removed by distillation at about 40 mm. of mercury pressure. The mixture is then heated to effect decarboxylation and the residue distilled at high vacuum. The residue is separated into its components by gas-liquid chromatography in accordance with the procedure of Example I. The mixture from which the components are isolated contains 7.0% by weight of Compound I, 21.0% by weight of Compound II, 28.4% by weight of Compound III and 38.5% by weight of Compounds V and VI.

WHAT WE CLAIM IS:—

1. A mixture characterized by a lemon-like aroma comprising the conjugated nitriles cis - 3, 7 - dimethyl - 2, 6 - octadienenitrile and trans - 3, 7 - dimethyl - 2, 6 - octadienenitrile together with the unconjugated nitriles 7 - methyl - 3 - methylene - 6 - octenenitrile; 3, 7 - dimethyl - 3, 7 - octadienenitrile, cis - 3, 7 - dimethyl - 3, 6 - octadienenitrile and trans - 3, 7 - dimethyl - 3, 6 - octadienenitrile.
2. A mixture according to Claim 1 containing a major proportion of conjugated nitriles.
3. A mixture according to Claim 1 containing a major proportion of unconjugated nitriles.
4. 7 - Methyl - 3 - methylene - 6 - octenenitrile.
5. 3, 7 - Dimethyl - 3, 7 - octadienenitrile.
6. 3, 7 - Dimethyl - 3, 6 - octadienenitrile.
7. A perfume composition containing as an olfactory ingredient a compound of the group consisting of 7 - methyl - 3 - methylene - 6 - octenenitrile; 3, 7 - dimethyl - 3, 7 - octadienenitrile; cis - 3, 7 - dimethyl - 3, 6 - octadienenitrile; trans - 3, 7 - dimethyl - 3, 6 - octadienenitrile, or mixtures thereof.
8. A composition according to Claim 7 additionally containing cis - or trans - 3, 7 - dimethyl - 2, 6 - octadienenitrile or mixtures thereof.
9. A composition according to Claim 7 or 8 in admixture with a soap, detergent, cosmetic or space deodorant.
10. A perfume composition according to Claim 7 substantially as described herein.
11. A process for the preparation of a mixture containing the conjugated nitriles cis - 3, 7 - dimethyl - 2, 6 - octadienenitrile and trans - 3, 7 - dimethyl - 2, 6 - octadienenitrile together with the unconjugated nitriles 7 - methyl - 3 - methylene - 6 - octenenitrile; 3, 7 - dimethyl - 3, 7 - octadienenitrile, cis - 3, 7 - dimethyl - 3, 6 - octadienenitrile and trans - 3, 7 - dimethyl - 3, 6 - octadienenitrile, which comprises condensing cyanoacetic acid with 2 - methyl - hept - 2 - ene - 5 - one in the presence of an amino compound, or a salt thereof with a mineral or an organic carboxylic acid, the reaction being carried out in an organic solvent and at a temperature of from 40°C. to 180°C.
12. A process according to Claim 11 wherein a salt or up to an equimolar quantity of amino compound based on the amount of cyanoacetic acid is employed and the mixture contains a major proportion of unconjugated nitriles.
13. A process according to Claim 11 wherein more than an equimolar quantity of amino compound based on the amount of cyanoacetic acid used is employed and the mixture contains a major proportion of conjugated nitriles.
14. A process according to Claim 11 or 12 wherein the catalyst is ammonium acetate.
15. A process according to Claim 11 or 13 wherein the catalyst is triethanolamine or cyclohexylamine.
16. A process, in accordance with Claim 11, for the preparation of a mixture containing the conjugated nitriles cis- and trans- 3, 7 - dimethyl - 2, 6 - octadienenitrile together with the unconjugated nitriles 7 - methyl - 3 - methylene - 6 - octenenitrile 3, 7 - dimethyl - 3, 7 - octadienenitrile, cis 3, 7 - dimethyl - 3, 6 - octadienenitrile and trans - 3, 7 - dimethyl - 3, 6 - octadienenitrile, substantially as described herein.
17. A mixture containing the conjugated nitriles cis - 3, 7 - dimethyl - 2, 6 - octadienenitrile and trans - 3, 7 - dimethyl - 2, 6 - octadienenitrile together with the unconjugated nitriles 7 - methyl - 3 - methylene - 6 - octenenitrile; 3, 7 - dimethyl - 3, 7 - octadienenitrile, cis - 3, 7 - dimethyl - 3, 6 - octadienenitrile and trans - 3, 7 - dimethyl - 3, 6 - octadienenitrile, whenever prepared by a process according to any one of Claims 11 to 16.
18. A mixture containing nitriles substantially



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fully as hereinbefore described with reference to Example I, Example II, or Example VII.

19. A perfume composition substantially as hereinbefore described with reference to any one of Examples III to VI.

For the Applicants:
CARPMAELS & RANSFORD,
Chartered Patent Agents,
24 Southampton Buildings,
Chancery Lane,
London, W.C.2.

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