Deodorant ingredients
“PANCIL”

PANCIL

Commitment to Full Production to Order

Since PANCIL (liquid product) is manufactured and shipped after receiving an order, please place an order at least 10 days (business days) in advance.

◆ Packing style

Bag manufacturing is done in 20 kg, and the minimum order quantity is 1 kg.

*Since our product is shipped in certain packing style (container) according to the necessary quantity, the packing style (container) cannot be specified.

“PANCIL®” Uses Persimmon Produced in Japan

<Atagogaki (Atago Persimmon), Ehime Prefecture>

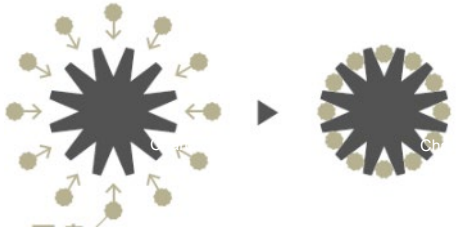
For PANCIL

Various Deodorization 4 Methods

1. Physical methods Foul odor components are adsorbed and removed using activated carbon, Silica, Absobent etc.

Advantage: Multiple foul odor components can be adsorbed simultaneously

Disadvantage: Odor components are easily re-released, eliminating the fragrance odor.

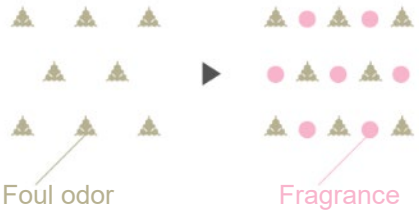


2. Masking methods Fragrances are used to make it difficult to feel foul odors

Advantage: Multiple foul odor components can be masked simultaneously

Disadvantage: Odor remains even after fragrance is gone

Bad odor and fragrance tend to mix and become an unpleasant smell



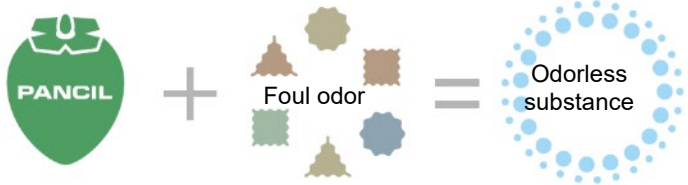
3. Anti-Bacterial methods Antibacterial agents only prevent the smell of generation by preventing the decomposition of substances produced by the human body (sebum, proteins, etc.).

In reality, there are a wide variety of odors in daily life, and there are limits to the range that can be deodorized. In addition, since antimicrobial agents only act on the surface of the biofilm formed by indigenous skin bacteria, odors derived from the remaining indigenous skin bacteria will continue to occur.

PANCIL

4. Chemical methods Foul odor components are modified by chemical reaction

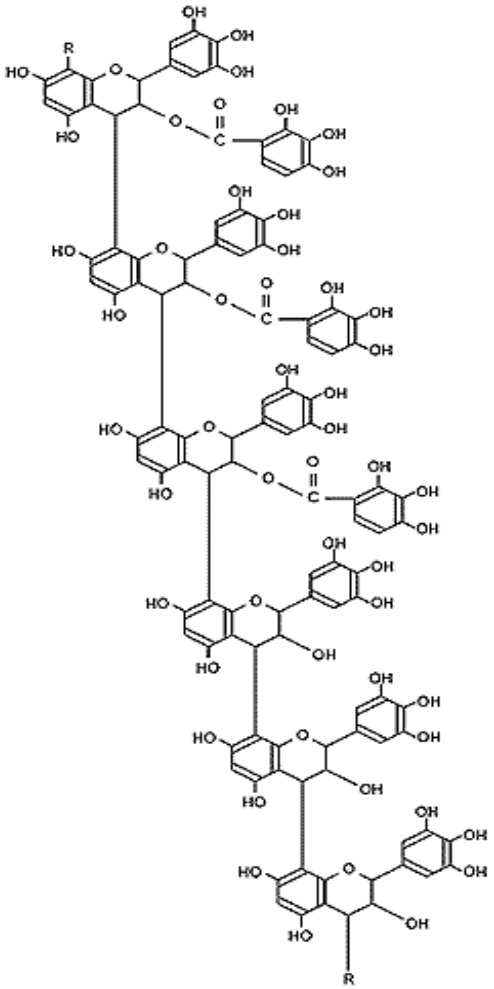
Advantage: Even though this deodorization tends to be Wide Spectrum to cover most of malodor, re-release is very unlikely to occur



⇒ "Raw materials of our company" utilize chemical reactions

Deodorizing foul odors by chemical methods

Chemical Structure of PANCIL



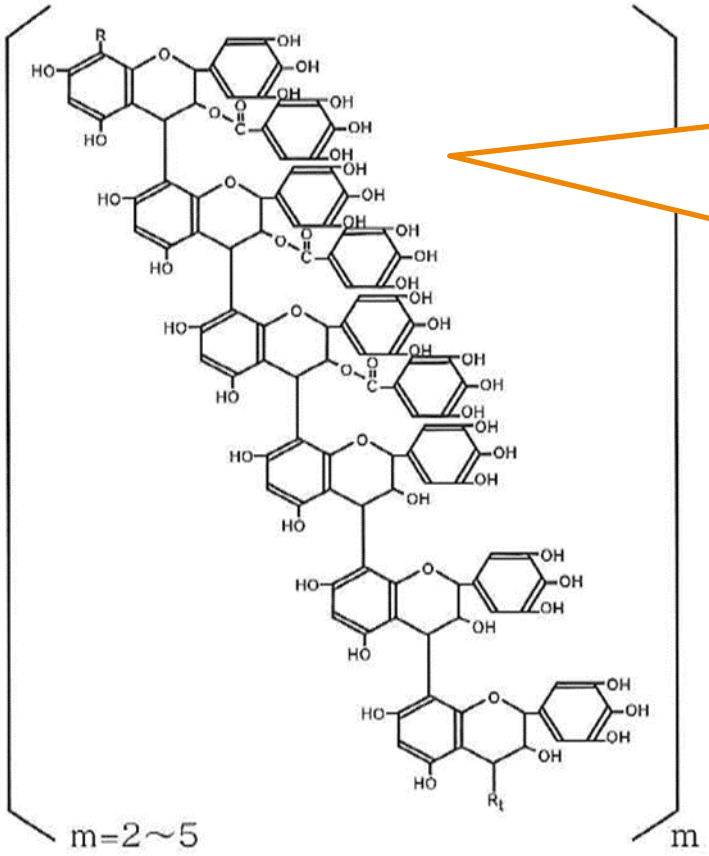
Estimated molecular structure

Among the ingredients of “PANCIL,” the substance responsible for deodorization is considered to be “persimmon tannin.”

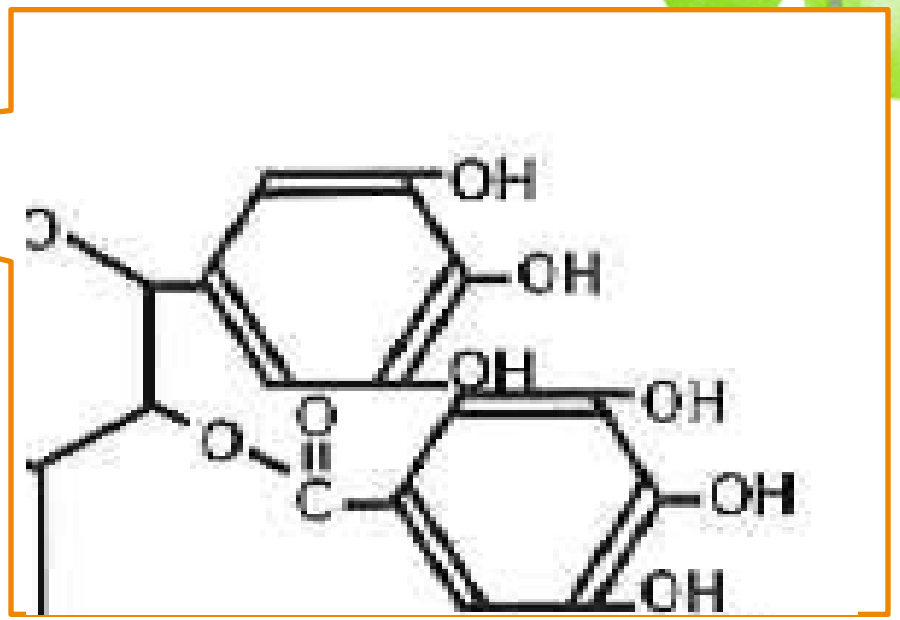
This “persimmon tannin” is a type of polyphenol, and it is a polymer with a much larger number of hydroxyl group (-OH) (reaction group) in the molecule than catechin, which is contained in Tea, Wine etc.

gigantic molecule with a molecular weight of approximately **15,000.**

Persimmon Tannin and Deodorization



柿の縮合型タンニンの推定構造式
The structure of a condensed tannin extracted from a persimmon



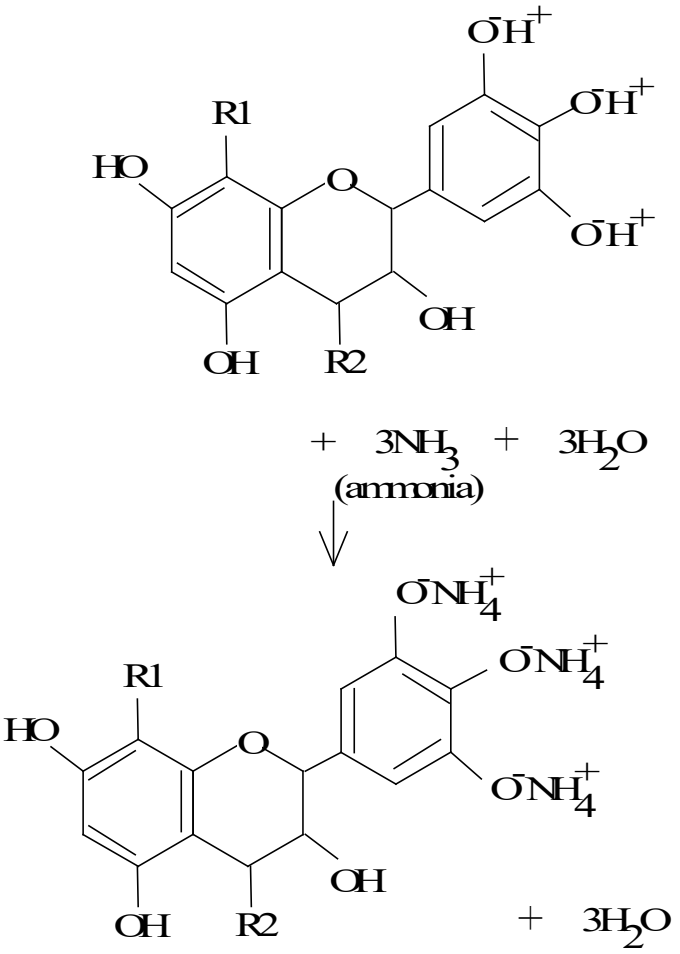
Phenolic OH groups react with offensive odor components.

Deodorization of Ammonia by Persimmon Tannin [1]

Neutralization reaction

"Persimmon tannin" is weakly acidic as a very small number of the OH groups dissociates.

Alkaline ammonia is taken in by the giant molecule of "persimmon tannin" through neutralization reaction, and prevented from vaporizing.

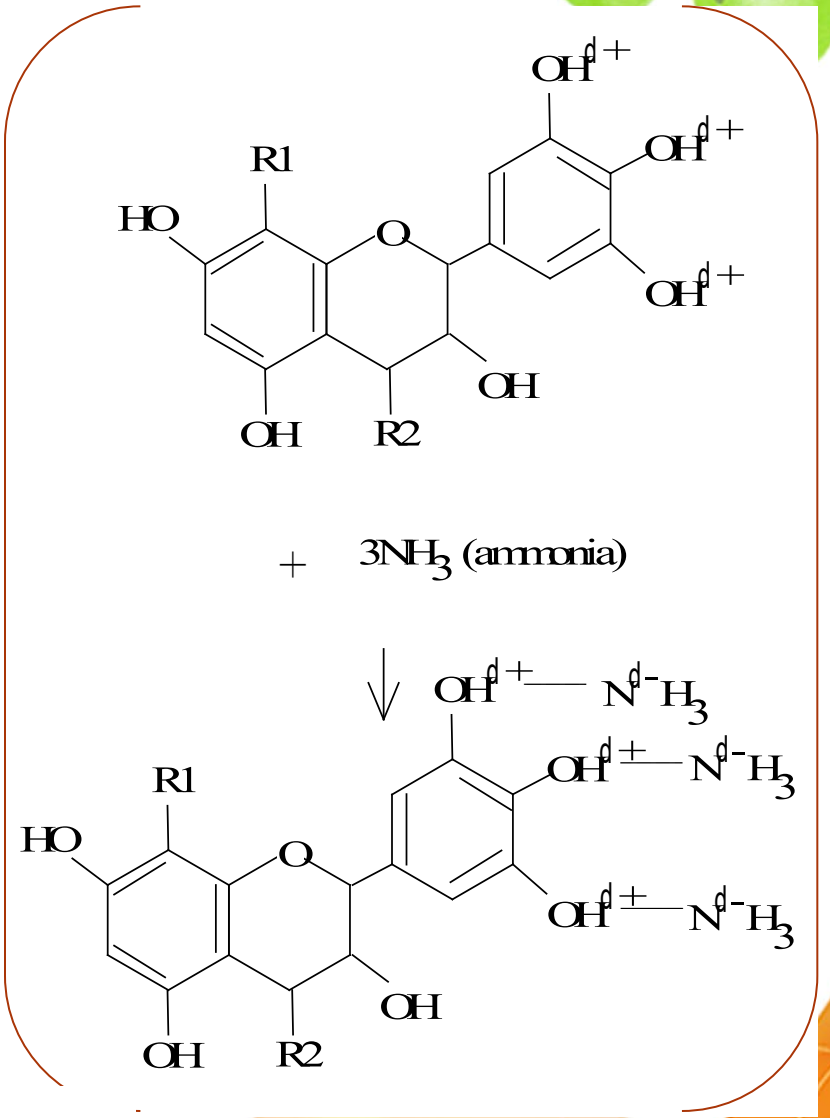


Deodorization of Ammonia by Persimmon Tannin [2]

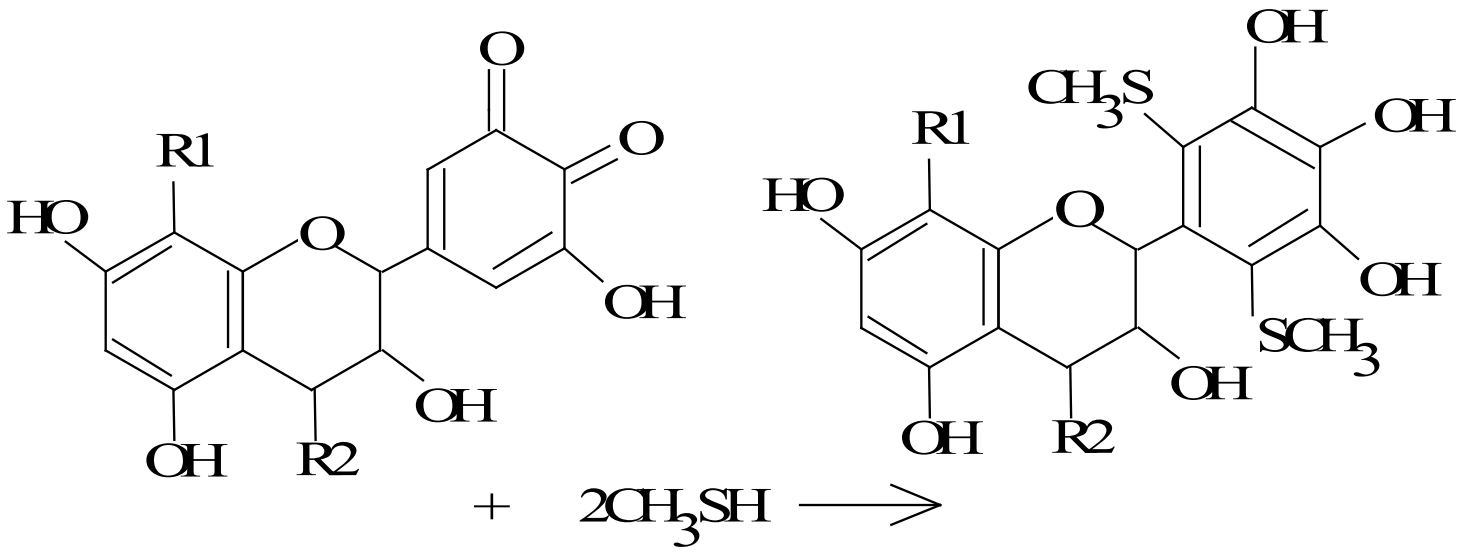
Hydrogen bonding

The H atom in the phenolic OH group is positively charged (+δ). Since an isolated electron pair exists in the N atom of ammonia, it is negatively charged (-δ).

Therefore, hydrogen bonding occurs between them, which exerts a large deodorizing power.



Deodorization of Methyl Mercaptan by Persimmon Tannin



(Allyl Mercaptan) (methyl mercaptan) (Hydrogen Sulfide)

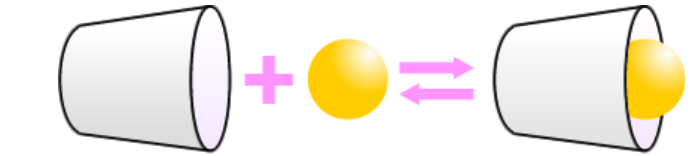
The phenolic OH group is <u>partially oxidized by alkali treatment.</u>
Oxidized persimmon tannin has oxidation power, and easily takes in the reducing methyl mercaptan, Allyl Mercaptan, Hydrogen Sulfide.

~Summary of 3 Deodorization Mechanism~

"Persimmon tannin," the main ingredient of PANCIL, is condensed tannin formed by polymerization of catechins, and it is a **gigantic molecule with a molecular weight of approximately 15,000.**

"Persimmon tannin" has many reactive phenolic hydroxyl groups, and it is assumed that it takes foul odor substances into the gigantic molecule through chemical reactions such as 1. Neutralization 2. Hydrogen bonding 3. Inclusion reaction, thereby contributing to deodorization.

(Inclusion activity by large molecular)



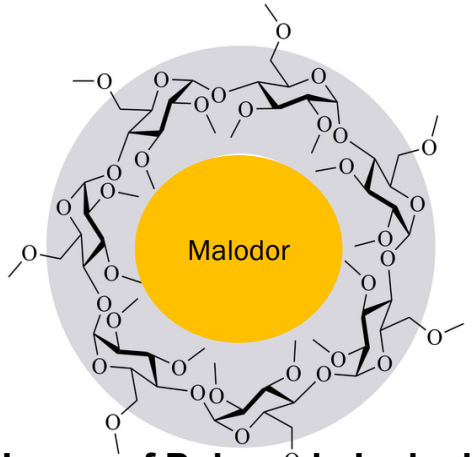


Image of Polymeric Inclusion

Examples of Odors That Can Be Tested for Deodorization (1)

Name of foul odor	Image of odor	Recommended product number
Ammonia	Pungent odor of urine Ex.) Sweat and urine	COS-17,BA-210-1
Trimethylamine	Odor of fish	COS-17,BA-210-1
Hydrogen sulfide	Rotten egg-like odor Ex.) Fecal(poop) odor, bad breath	COS-20,PS-M
Methyl mercaptan	Rotten onion-like odor Ex.) Fecal(poop) odor, bad breath	COS-20,PS-M
Allyl mercaptan	Odor of garlic	COS-20,PS-M
Body odor (3MSH) *1	Odor of spice mixed with sulfur and pungency Ex.) abnormal underarm odor	COS-17,COS-20
Fabric Half dry odor (4M3H) *2	Odor of old dustcloth	COS-17,COS-20
Acetic acid	Odor of vinegar Ex.) Sweat, body odor	COS-17,BA-210-1
Isovaleric acid	Odor of the sole of sweaty foot Ex.) Sweat, body odor	COS-17,BA-210-1

*1: Body odor (3MSH) ... 3-methyl-3-sulfanylhexan-1-ol(Abnormal underarm odor)

*2: Fabric Half dry odor (4M3H) ... 4-methyl-3-hexenoic acid

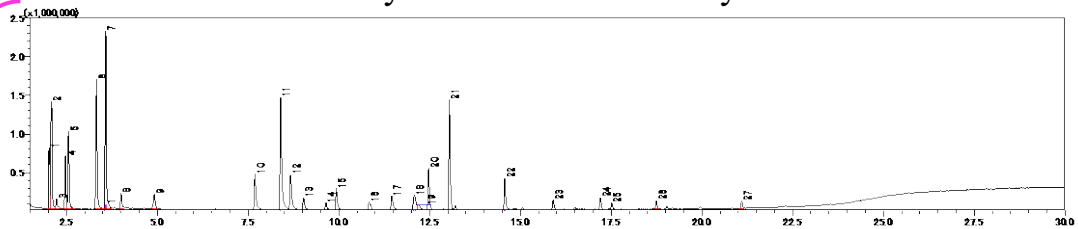
Examples of Odors That Can Be Tested for Deodorization (2)

Name of foul odor	Image of odor	Recommended product number
Diacetyl	Odor of old used oil Generational odor occurring in the early 30s.	FG-70,COS-16
Nonenal	Oil-like and grassy odor Ex.)Age-related odour from around the 50s.	FG-70,COS-16
Acetaldehyde	Tabacco odor Ex.)Causes of cigarettes odor	FG-70,COS-16
Pyridine	Pungent odor of rotten fish Ex.)Causes of cigarettes odor	FG-60,FG-70
n-Butyric acid	Cheese-like fermented odor Ex.) Sweat, body odour	COS-17,BA-210-1
Formaldehyde	Odor of a new house	COS-17,FG-60
2-Methylisoborneol	Indian ink-like odor Ex.)Muddy mouldy odor	PO-10
Geosmin	Mud-like odor Ex.)Muddy mouldy odor	PO-10
1-Octen-3-one	Odor of rusted iron Ex.) Smell of rusty iron, blood odour	FG-70,COS-16

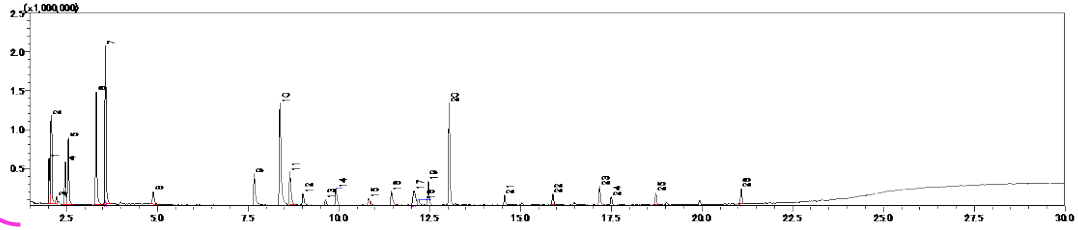
PANCIL does not disturb perfume

PEACH oil

Results of GC-MS analysis of PEACH oil only

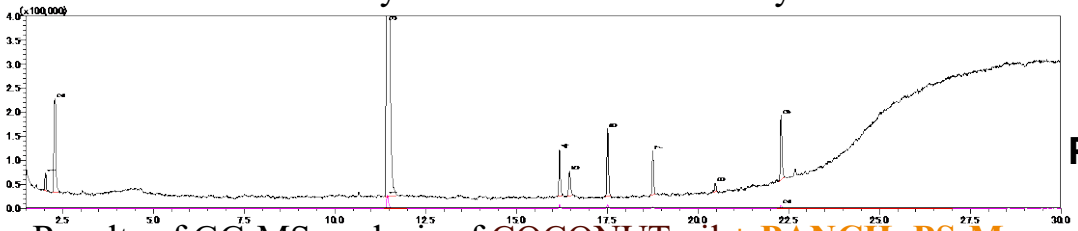


Results of GC-MS analysis of PEACH oil + PANCIL PS-M

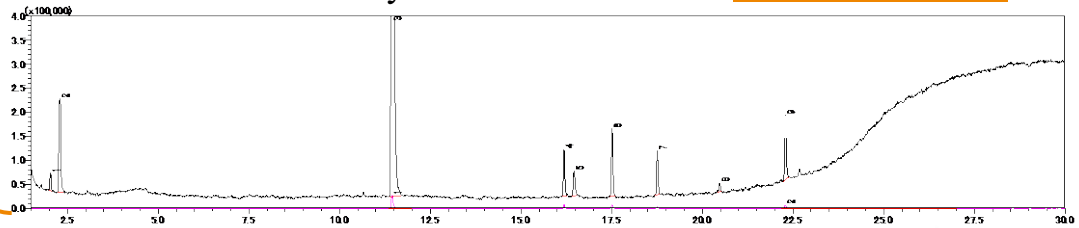


COCONUT oil

Results of GC-MS analysis of COCONUT oil only



Results of GC-MS analysis of COCONUT oil + PANCIL PS-M

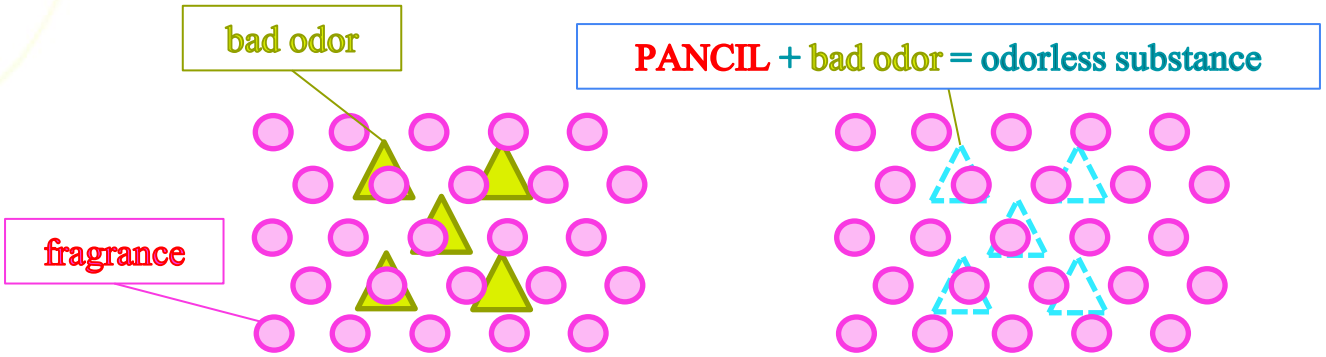


No difference was observed in GC-MS data even when PANCIL PS-M, which contains the largest amount of persimmon tannin, was used.

It is therefore concluded that PANCIL cannot deodorize fragrances.

PANCIL does not disturb perfume

Disturbance of High dosage% fragrance



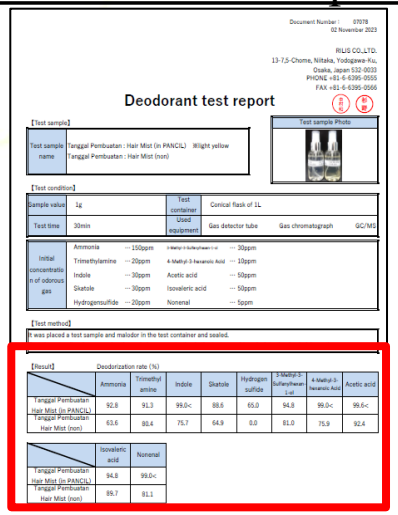
Too much fragrance and only smells of fragrance
We cannot determine if PANCIL is deodorizing.

Because there is little fragrance,
it is easy to judge whether PANCIL is deodorizing or not.

It is possible to reduce the amount of fragrance, thus cutting costs!!

Disturbance of High dosage% fragrance

Deodorant test report


Deodorant test report

Test sample Photo

Evaluation of samples containing highly concentrated fragrances

CONCLUSION:
Although sample with Pancil(Upper) has a sufficient deodorizing effect, the fragrance dosage% is too high for the human sense of smell to detect the deodorizing effect of PANCIL.

Therefore, by recommending a lower dosage % of fragrance added than in the current formulation,
the deodorizing effect can be more easily perceived and costs can be reduced.

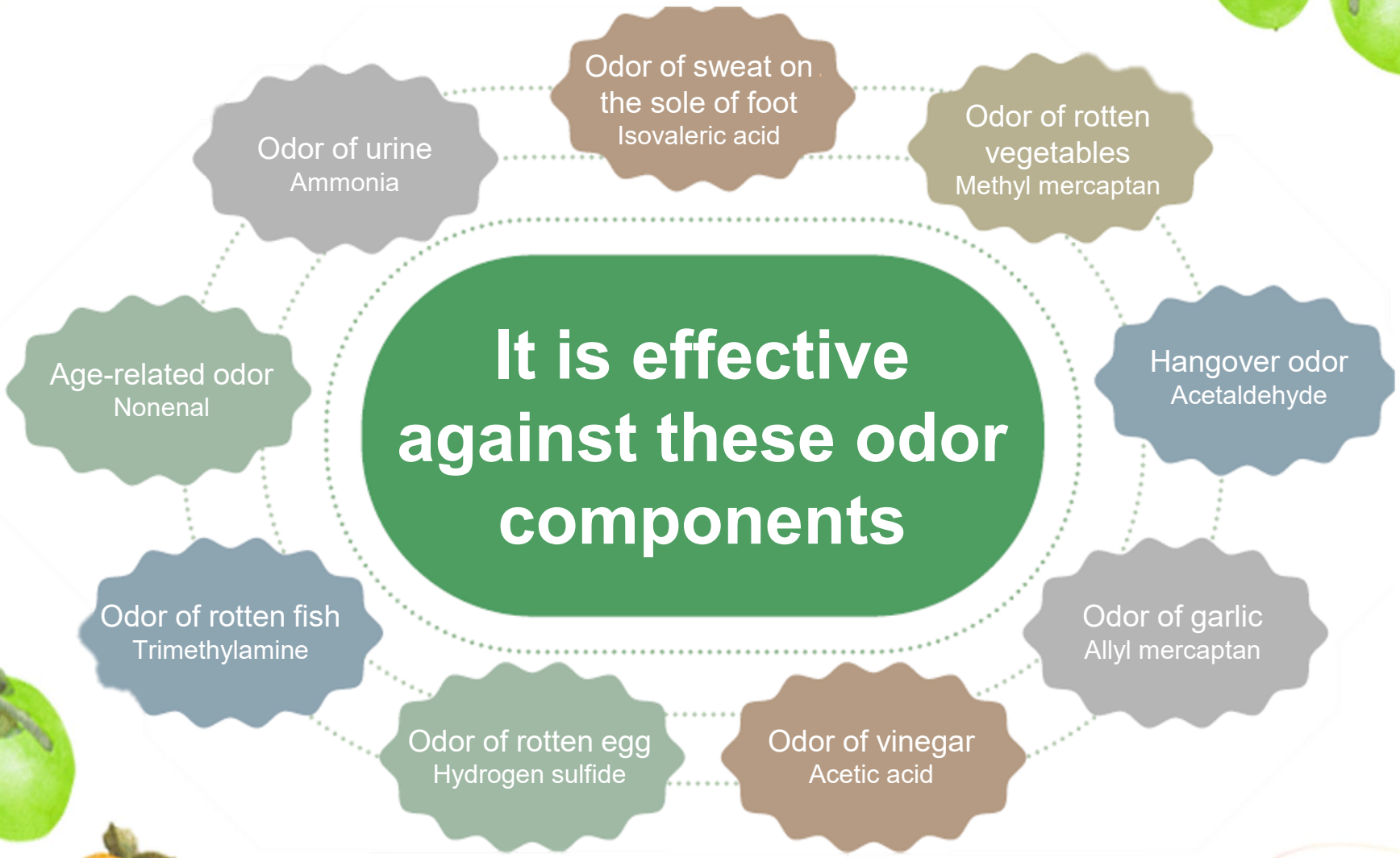
【Result】 Deodorization rate (%)

	Ammonia	Trimethyl amine	Indole	Skatole	Hydrogen sulfide	3-Methyl-3-Sulfanylhexan-1-ol	4-Methyl-3-hexanoic Acid	Acetic acid
Upper: Tanggal Pembuatan Hair Mist (in PANCIL)	92.8	91.3	99.0<	88.6	65.0	94.8	99.0<	99.6<
Bottom: Tanggal Pembuatan Hair Mist (non)	63.6	80.4	75.7	64.9	0.0	81.0	75.9	92.4

	Isovaleric acid	Nonenal
Upper: Tanggal Pembuatan Hair Mist (in PANCIL)	94.8	99.0<
Bottom: Tanggal Pembuatan Hair Mist (non)	89.7	81.1

Higher Deodorization rate(%) means higher deodorant efficacy.

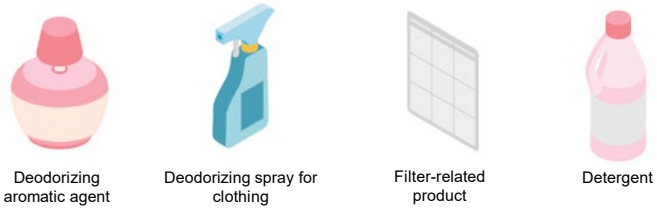
PANCIL Wide Spectrum to cover entire malodors



Types of PANCIL

Home care grade

A deodorizing material for miscellaneous goods using persimmon extract as the main ingredient



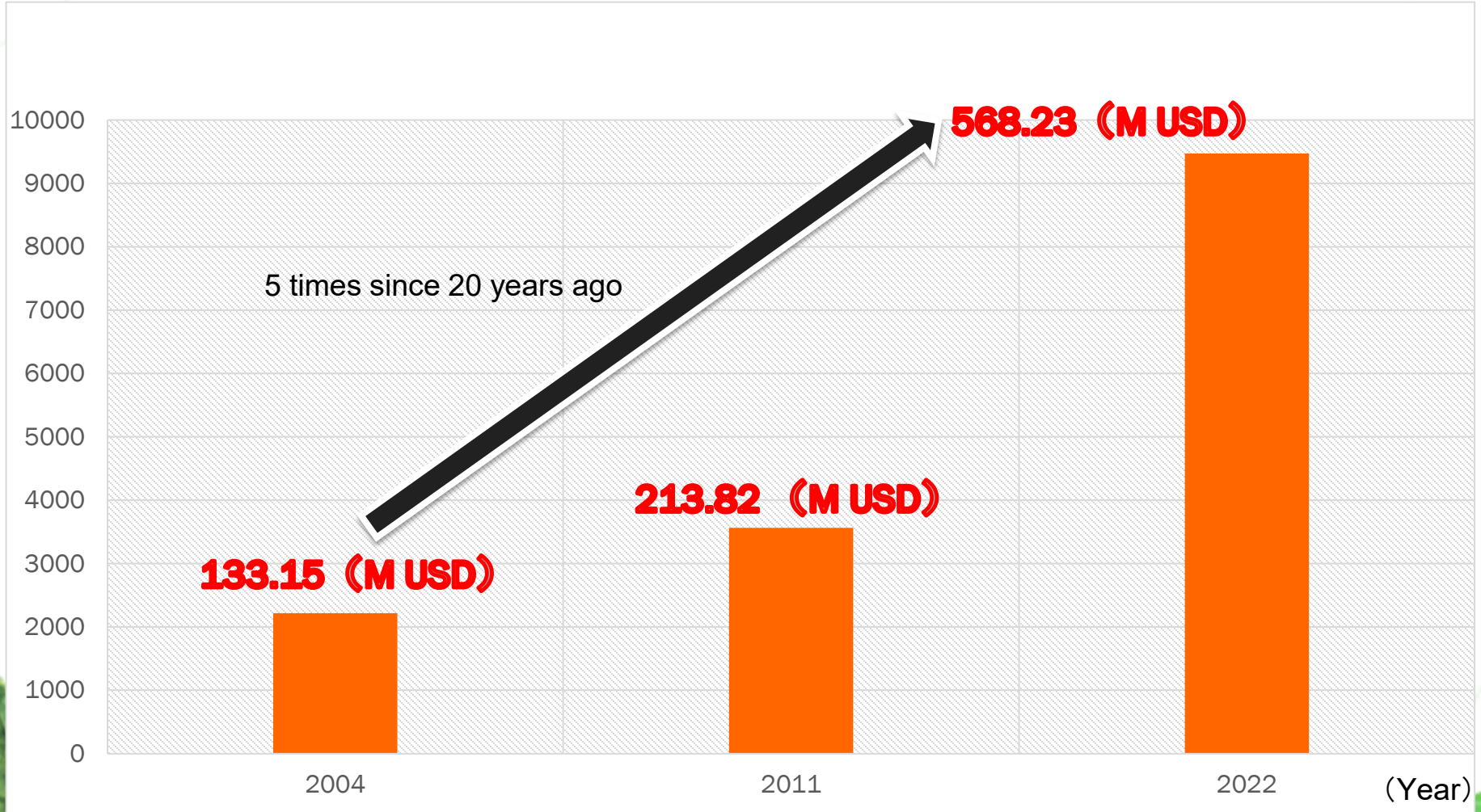
Cosmetics grade

A product prepared from the raw materials listed in the Japanese Standards of Quasi-drug Ingredients 2021 using persimmon extract as the main ingredient

Food Oral grade

A food additive pharmaceutical preparation prepared by using persimmon extract as the main ingredient and other ingredients listed as food additives

Deodorant air freshener market (Indoor data only) (in Japan)



Quote source:S.T.CORPORATION and FUJI KEIZAI CO., LTD. **(M USD) = Million USD**

About HALAL compatible products

At PANCIL PS-M,
it has obtained HALAL certification.

PANCIL PS-M

NAHA
Nippon Asia Halal Association
Certificate of Halal Authentification
ハラール認証書

It is certified that (以下の通り確定する)
PANCIL PS-M (パンシル PS-M)

Manufactured / Distributed by (製造者 / 販売者)
Company Name :
Company Address : 5-13-7 Nitaka, Yodogawa-ku, Osaka-shi, Osaka-fu 532-0033 Japan
〒532-0033 大阪府大阪市淀川区新高 5-13-7
Factory Address : 1570 Nakanoshima, Wakayama-shi, Wakayama-ken 640-8392 Japan
〒640-8392 和歌山県和歌山市中之島 1570
Telephone : 06-6395-0555
Fax : 06-6395-0566
Website : www.rilis.co.jp

HALAL
NIPPON ASIA HALAL ASSOCIATION

Have complied with the HALAL requirement according to Islamic Law and is authorized to use the HALAL MARK and QR CODE issued by the undersigned authority until date of expiry.
貴社は、イスラーム法に基づいたハラールの基準に従い、有効期限まで、署名した団体により発行されたハラールマークと QR コードの使用を認められます。

NAHA Ref No : OCI200608-1-FCI
Date of Issue : 8 June 2023
Date of Expiry : 7 June 2024

حلال HALAL

Mohammad Anas
Director

Nippon Asia Halal Association
2-6-2, CICC Building 5F, Matsunami, Chiba-shi, Chiba, Japan 260-0044

Halal Certificate

Because of its increasing use in countries other than Japan, the company aims to obtain HALAL certification for liquid-based PANCIL in the future.

Our Follow-up Details

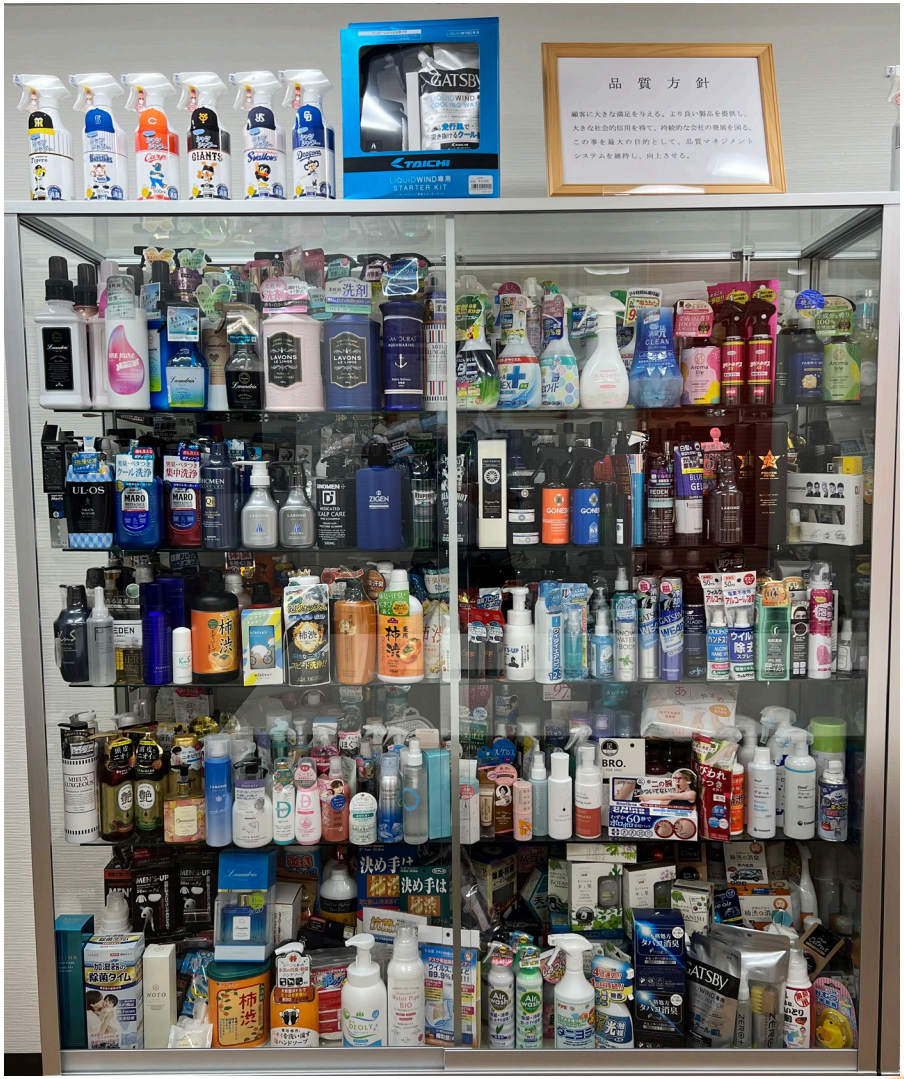
Selection of PANCIL Grade
Proposals can be made according to the application.

Sample submission to customer

Formulation at customer with formulation support

Perform deodorant test and submit report
(free of charge)

◆Various Products Developed Using PANCIL as a Raw Material



◆Various Products Developed Using PANCIL as a Raw Material

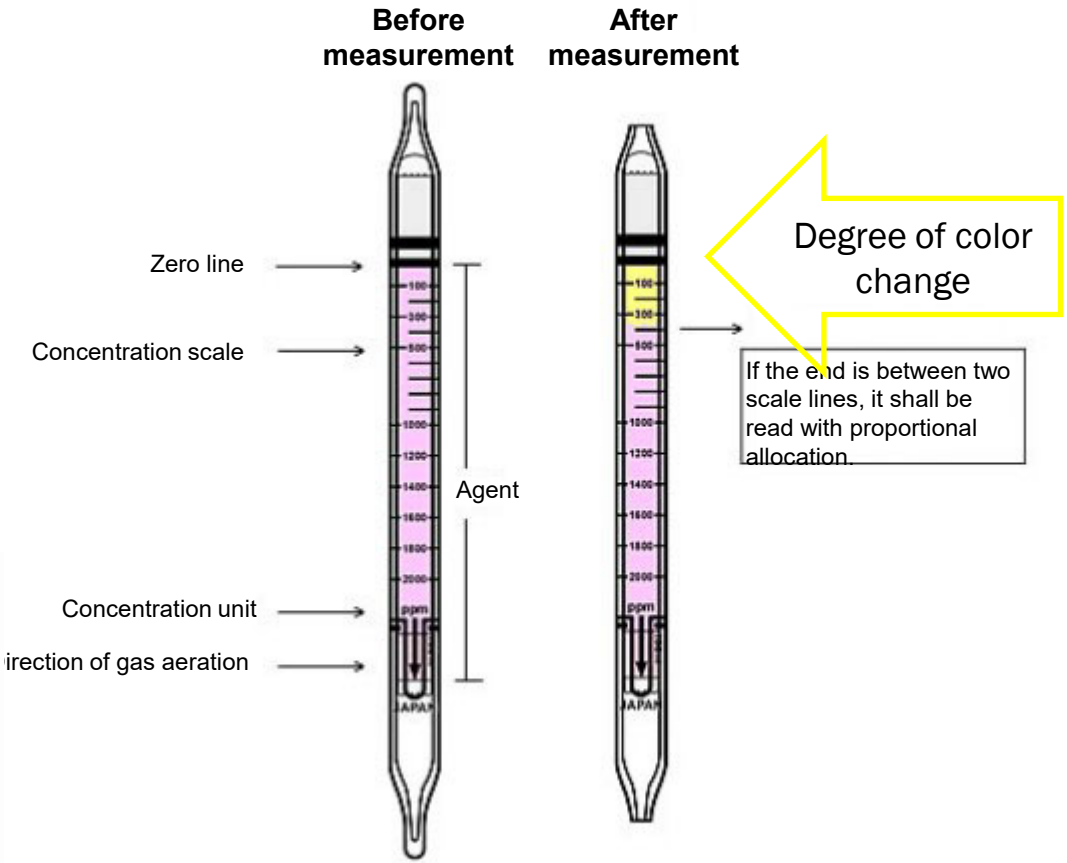
Introduction of Lab Evaluation Methods

Deodorization Tests

-Gas-detecting tube method-

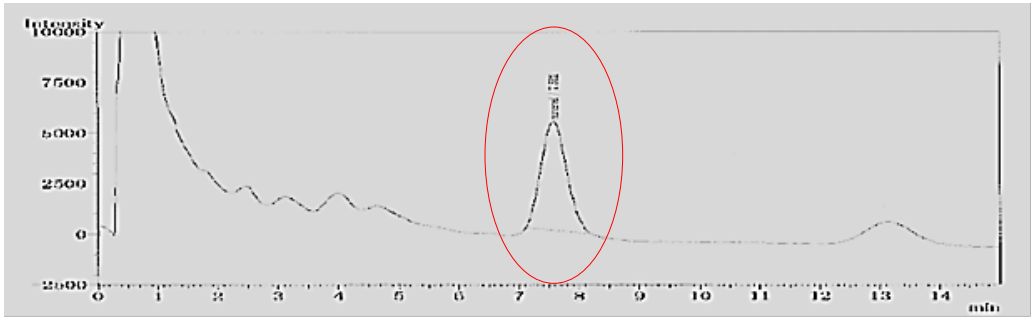
Sample collection pump

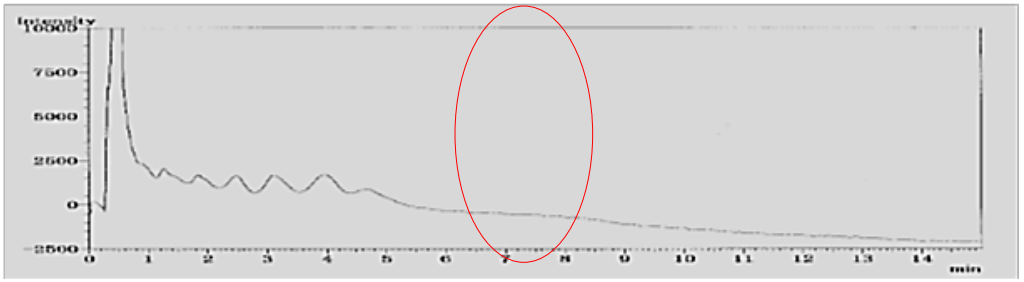
Glass detector tube



Deodorization Tests

-Gas Chromatograph (GC)-

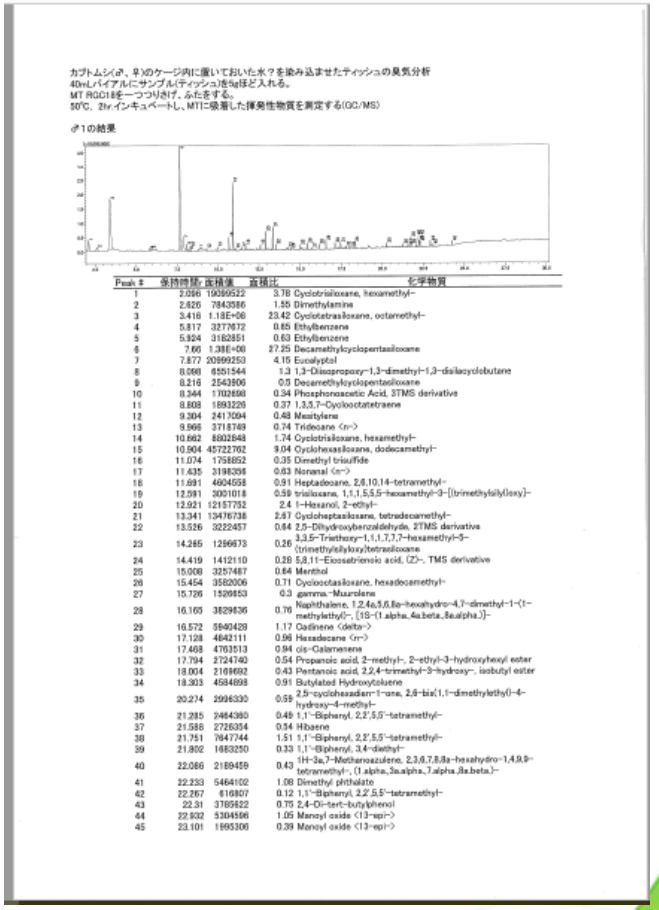




It is possible to measure foul odors that cannot be handled by detector tubes.
It is possible to measure the concentrations that are relatively lower than detector tubes.

Deodorization Tests

-Sniffing Gas Chromatograph Mass Spectrometer-
(Sniffing GC-MS)



カゴトムシ(♂、♀)のケージ内に置いておいた水♀を染み込ませたティッシュの臭気分析
40mLバイアルにサンプル(ティッシュ)を4g程ど入れる。
MT RGC18を一つつりさげ、ふたをする。
50℃、2hr.インキュベートし、MTに吸着した揮発性物質を測定する(GC/MS)

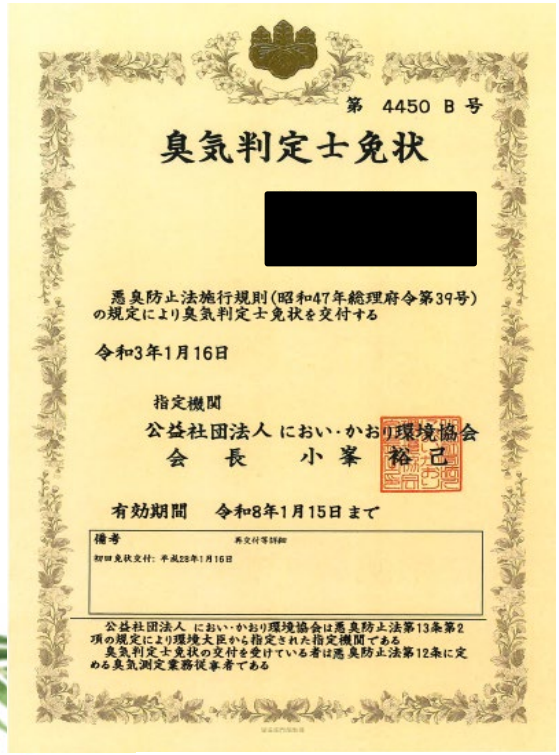
♂1の結果

Peak #	保持時間	面積値	面積比	化学物質
1	2.096	19036522	3.78	Cyclotrisiloxane, hexamethyl-
2	2.626	7843586	1.55	Dimethylamine
3	3.416	1.18E+08	23.42	Cyclotetrasiloxane, octamethyl-
4	5.817	3277672	0.65	Ethylbenzene
5	5.924	3162851	0.63	Ethylbenzene
6	7.66	1.38E+08	27.25	Decamethylcyclopentasiloxane
7	7.877	20999253	4.15	Eucalyptol
8	8.068	6551544	1.3	1,3-Diisopropoxy-1,3-dimethyl-1,3-disilacyclobutane
9	8.216	2543906	0.5	Decamethylcyclopentasiloxane
10	8.344	1702698	0.34	Phosphonoacetic Acid, 3TMS derivative
11	8.808	1893226	0.37	1,3,5,7-Cyclooctatetraene
12	9.304	2417094	0.48	Mesitylene
13	9.966	3718749	0.74	Tridecane <n->
14	10.662	8802848	1.74	Cyclotrisiloxane, hexamethyl-
15	10.904	45722702	9.04	Cyclohexasiloxane, dodecamethyl-
16	11.074	1758852	0.35	Dimethyl trisulfide
17	11.635	3198356	0.63	Nonanal <n->
18	11.691	4604558	0.91	Heptadecane, 2,6,10,14-tetramethyl-
19	12.591	3001018	0.59	trisiloxane, 1,1,1,5,5,5-hexamethyl-3-[(trimethylsilyl)oxy]-
20	12.921	12157752	2.4	1-Hexanol, 2-ethyl-
21	13.341	13476738	2.67	Cycloheptasiloxane, tetradecamethyl-
22	13.526	3222457	0.64	2,5-Dihydroxybenzaldehyde, 2TMS derivative
23	14.265	1286673	0.26	3,3,5-Trinthoxy-1,1,1,7,7,7-hexamethyl-3-(trimethylsilyloxy)tetrasiloxane
24	14.419	1412110	0.28	5,8,11-Eicosatrienoic acid, (Z)-, TMS derivative
25	15.008	3257487	0.64	Menthol
26	15.454	3582006	0.71	Cyclooctasiloxane, hexadecamethyl-
27	15.726	1526853	0.3	gamma.-Muurolene
28	16.165	3829836	0.76	Naphthalene, 1,2,4a,5,6,8a-hexahydro-4,7-dimethyl-1-(1-methylethyl)-, [1S-(1.alpha.,4a.beta.,8a.alpha.)]-
29	16.572	5940428	1.17	Cadinene <delta->
30	17.128	4842111	0.96	Hexadecane <n->
31	17.468	4763513	0.94	cis-Calamenene
32	17.794	2724740	0.54	Propanoic acid, 2-methyl-, 2-ethyl-3-hydroxyhexyl ester
33	18.004	2169692	0.43	Pentanoic acid, 2,2,4-trimethyl-3-hydroxy-, isobutyl ester
34	18.303	4584898	0.91	Butylated Hydroxytoluene
35	20.274	2996330	0.59	2,5-cyclohexadien-1-one, 2,6-bis(1,1-dimethylethyl)-4-hydroxy-4-methyl-
36	21.285	2484360	0.49	1,1'-Biphenyl, 2,2',5,5'-tetramethyl-
37	21.588	2726354	0.54	Hibaene
38	21.751	7647744	1.51	1,1'-Biphenyl, 2,2',5,5'-tetramethyl-
39	21.802	1683250	0.33	1,1'-Biphenyl, 3,4'-diethyl-
40	22.086	2189459	0.43	1H-3a,7-Methanoazulene, 2,3,6,7,8,8a-hexahydro-1,4,9,9-tetramethyl-, (1.alpha.,3a.alpha.,7.alpha.,8a.beta.)-
41	22.233	5464102	1.08	Dimethyl phthalate
42	22.267	616807	0.12	1,1'-Biphenyl, 2,2',5,5'-tetramethyl-
43	22.31	3785922	0.75	2,4-Di-tert-butylphenol
44	22.932	5304596	1.05	Manoyl oxide <13-epi->
45	23.101	1995306	0.39	Manoyl oxide <13-epi->

It is possible to measure foul odors that could not be measured even by GC.
It is possible to separate the chemicals from a complex mixture, and identify what kind of chemical substances are generated from the target material.

About the Test Administrator

We have five nationally certified odor judges who have undergone training to conduct deodorant tests.



第 4450 B 号

臭気判定士免状

[redacted]

悪臭防止法施行規則（昭和47年総理府令第39号）の規定により臭気判定士免状を交付する

令和3年1月16日

指定機関

公益社団法人 におい・かおり環境協会

会　長　　小峯　裕己

有効期間　令和8年1月15日まで

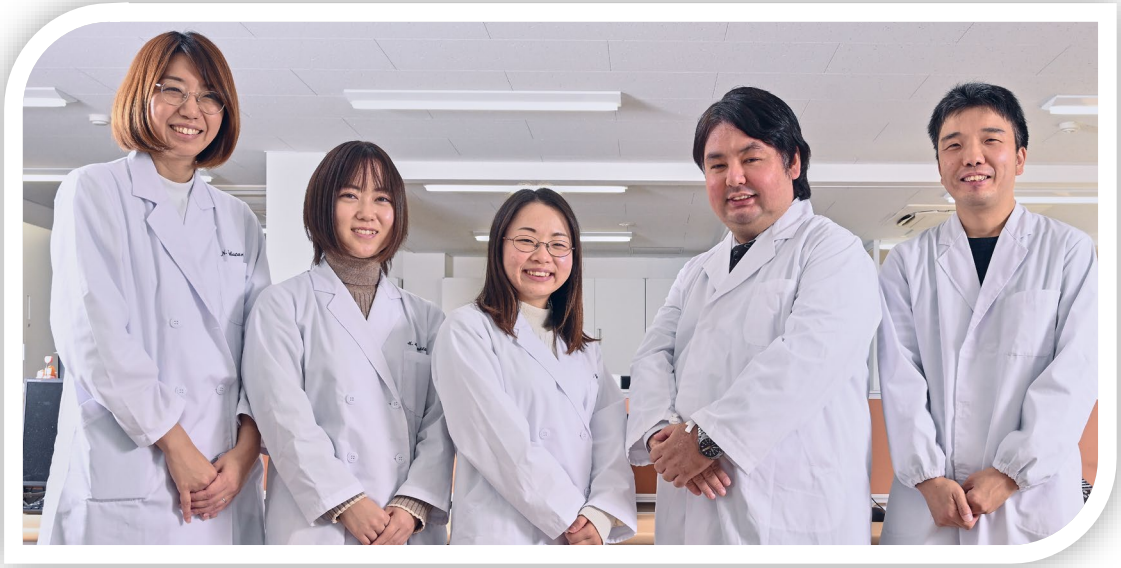
備考

初回免状交付：平成28年1月16日

公益社団法人 におい・かおり環境協会は悪臭防止法第13条第2項の規定により環境大臣から指定された指定機関である

臭気判定士免状の交付を受けている者は悪臭防止法第12条に定める臭気測定業務従事者である

National license certificate



All researchers are certified.

Test report is available upon request

Document Number : 07078
02 November 2023

Deodorant test report

【Test sample】

Test sample name	[redacted]

Test sample Photo

【Test condition】

Sample value	1g	Test container	Conical flask of 1L		
Test time	30min	Used equipment	Gas detector tube	Gas chromatograph	GC/MS

Initial concentration of odorous gas	Ammonia	--- 150ppm	3-Methyl-3-Sulfanylhexan-1-ol	--- 30ppm
	Trimethylamine	--- 20ppm	4-Methyl-3-hexanoic Acid	--- 10ppm
	Indole	--- 30ppm	Acetic acid	--- 50ppm
	Skatole	--- 30ppm	Isovaleric acid	--- 50ppm
	Hydrogensulfide	--- 20ppm	Nonenal	--- 5ppm

【Test method】

It was placed a test sample and malodor in the test container and sealed.

【Result】 Deodorization rate (%)

	Ammonia	Trimethyl amine	Indole	Skatole	Hydrogen sulfide	3-Methyl-3-Sulfanylhexan-1-ol	4-Methyl-3-hexanoic Acid	Acetic acid
Tanggal Pembuatan Hair Mist (in PANCIL)	92.8	91.3	99.0<	88.6	65.0	94.8	99.0<	99.6<
Tanggal Pembuatan Hair Mist (non)	63.6	80.4	75.7	64.9	0.0	81.0	75.9	92.4

	Isovaleric acid	Nonenal
Tanggal Pembuatan Hair Mist (in PANCIL)	94.8	99.0<
Tanggal Pembuatan Hair Mist (non)	89.7	81.1

Thank you for your attention

Deodorizing effect of Aluminum chlorohydrate.

【Result】 Deodorization rate(%)

	Ammonia	Trimethyl amine	Hydrogen sulfide	3MSH※	Acetic acid	Isovaleric acid	n-Butyric acid
Water only	81.0	80.6	0.0	88.0	92.6	91.0	90.6
Aluminum Chlorohydrate 5%a.q.	82.5	86.0	0.0	84.0	91.8	89.0	91.0
PANCIL BA-210-1 5%a.q.	99.7<	98.5<	0.0	96.3	99.6<	97.6<	98.0<
PANCIL COS-17 5%a.q.	99.7<	98.5<	99.7<	98.0	99.6<	97.6<	98.0<
PANCIL COS-20 5%a.q.	91.0	96.0	99.7<	99.0<	99.6<	97.6<	98.0<

	Form Aldehyde	2-Nonenal
Water only	79.0	0.0
Aluminum Chlorohydrate 5%a.q.	78.0	0.0
PANCIL BA-210-1 5%a.q.	98.3<	0.0
PANCIL COS-17 5%a.q.	98.3<	0.0
PANCIL COS-20 5%a.q.	98.3<	92.3

The deodorizing effect was no different from that of water alone.

Check for odor return

We checked to see if odor reversion was occurring.

(1) The deodorant rate was measured when water and PANCIL were each stored at 25°C for 1 hour.
(2) Then, the temperature was increased to 70°C and stored for 5 hours, and the deodorant rate was measured.
(3) The temperature was then returned to 25°C and stored for 1 hour, and the deodorant rate was measured.

【Result】 Residual concentration (ppm) / Initial concentration:150ppm

	Ammonia		
temperature	25℃	70℃	25℃
Water only	20.0ppm	75.0ppm	80.0ppm
PANCIL BA-210-1 5%a.q.	0.0ppm	0.0ppm	0.0ppm

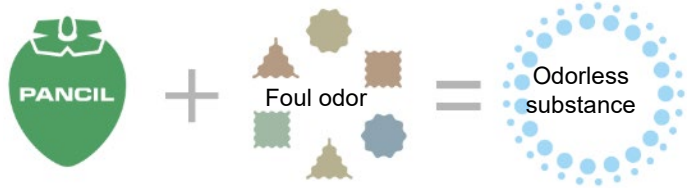
In the case of water alone, the concentration of Ammonia increased as the temperature increased, indicating that Ammonia is being re-released.

In the case of PANCIL, the concentration does not change when the temperature is increased, indicating that the ammonia has changed to an odorless substance.

Various Deodorization 4 Methods

4. Chemical methods Foul odor components are modified by chemical reaction

Advantage: Even though this deodorization tends to be Wide Spectrum to cover most of malodor, re-release is very unlikely to occur



⇒ "Raw materials of our company" utilize chemical reactions

Deodorizing foul odors by chemical methods

Botanical Polymer for Human and Environmental safety and SDGs claiming