

Supplementary Materials

Detection of counterfeit perfumes by using GC-MS technique and electronic nose system combined with chemometric tools

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Table S1. Sensitivities of the TGS sensors used in the electronic nose unit

Sensor Name	Target gases
TGS 815	High sensitivity and high selectivity to methane, propane, and butane
TGS 821	Highly sensitive to organic solvent vapors and a wide variety of combustible gases such as carbon monoxide, and hydrogen
TGS 822	Organic solvents
TGS 824	NH ₃
TGS 825	H ₂ S, Ethylene
TGS 842	Domestic gas alarm, alcohol vapors, and methane

Table. S2 Indicative names of the main volatile compounds in the perfume samples identified by GC-MS technique.

No.	Compounds	No.	Compounds	No.	Compounds
1	Ethanol, 2-(2-ethoxyethoxy)-	34	Benzene, 1-methoxy-4-methyl (p-Methylanisole)	67	3 trans- β -Ionone
2	Benzyl alcohol	35	Cyclosia (Hydroxycitronellal)	68	Benzene, 1,2-dimethoxy-4-(1-propenyl)- (Isoeugenol methyl ether)
3	Benzenepropanol	36	Limonene	69	Cashmeran
4	Propanoic acid, phenylmethyl ester	37	Limonene	70	Butylated hydroxytoluene (Antioxidant 29)
5	Hydroxycitronellal	38	Eucalyptol	71	1-Penten-3-one, 1-(2,6,6-trimethyl-2-cyclohexen-1-yl) (α -N-Methyl ionone)
6	10-Undecenal	39	Dipropylene glycol isomer/derivative	72	Lilial
7	2,6-Octadiene, 2,6-dimethyl-	40	Terpinene	73	Benzoic acid, 2-hydroxy-, pentyl ester (Amyl salicylate)
8	Benzaldehyde, 3-hydroxy-4-methoxy-(vanillin)	41	Dihydromyrcenol	74	Butylated hydroxytoluene
9	α -Gurjunene	42	cis-Linalyl oxide	75	Helional
10	Helional	43	Benzoic acid, methyl ester	76	Diethyl phthalate
11	Isoaromadendrene epoxide	44	1 β -Linalool	77	Guaiol
12	Methyl dihydrojasmonat	45	Phenylethyl alcohol	78	Cedrol
13	2-Butanol, 3,3'-oxybis	46	Benzyl acetate	79	Ethyl citrate
14	Benzenemethanol, α -methyl-, acetate	47	1,2-Dihydropyridine, 1-(1-oxobutyl)	80	Methyl dihydrojasmonate
15	Dipropylene glycol isomer/derivative	48	Decanal	81	Atracic acid
16	Benzoic acid, 2-hydroxy-, ethyl ester	49	Linalyl formate	82	Ambrox
17	Allyl (isopentyloxy)acetate	50	β -Citronellol	83	Benzyl benzoate
18	Phenylallyl alcohol (Cinnamyl alcohol)	51	Linalyl anthranilate	84	Octanal, 2-(phenylmethylene) (α -Hexylcinnamaldehyde)
19	Benzene, 2-(1,1-dimethylethyl)-1,4-dimethoxy	52	Piperonal	85	Isopropyl myristate
20	2-Propen-1-ol, 3-phenyl-, acetate	53	Phenol, 2-methoxy-3-(2-propenyl)	86	9-Decen-1-ol
21	β -Cubebene	54	2,6-Octadien-1-ol, 3,7-dimethyl-, acetate, (E)- (Geraniol acetate)	87	Musk ambrette, natural
22	α -Farnesene	55	Geraniol acetate	88	Lycopersilure
23	2-Butanol, 3,3'-oxybis	56	Vanillin	89	11-Tetradecen-1-ol, (E)
24	Ethyl linalool	57	Dodecanal	90	11-Dodecenol
25	Cyclohexene, 1-methyl-4-(1-methylethylidene)-	58	α -Cedrene	91	Muskalactone
26	α -Ionone, 6-methyl-	59	Caryophyllene	92	Galaxolide

27	2-Propanol, 2-methyl-	60	α -Ionone	93	Benzoic acid, 2-hydroxy-, phenylmethyl ester (Benzyl salicylate)
28	α -Pinene	61	Coumarin	94	Polycyclic musk
29	Menthene	62	trans-Isoeugenol, (E)	95	7-Acetyl-6-ethyl-1,1,4,4-tetramethyltetralin
30	β -Pinene	63	Ethyl vanillin	96	Cyclopenta[g]-2-benzopyran, 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethyl-
31	β -Myrcene	64	Isoeugenol methyl ether	97	Acetophenone, 4'-tert-butyl-2',6'-dimethyl-3',5'-dinitro- (Musk 36A)
32	Hexylacetate	65	α Isomethyl ionone (α -Cetone)	98	Ethylene brassylate (Musk T)
33	Dipropylene glycol isomer/derivative	66	3-Penten-2-one, 4-(2,6,6-trimethyl-2-cyclohexen-1-yl)	99	2-Propenoic acid, 3-(4-methoxyphenyl)-, 2-ethylhexyl ester (Parsol MCX)
100					
Ethanol					

Figure S1.

Dynamic response of the six gas sensor array in the form of conductance when exposed to: (a) sample of original (A.O) perfume, (b) sample of counterfeit (A.I) perfume

