

OTHER MEDIA

detection (d) and recognition (r) odour threshold values in mg/kg

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acetal⇒1,1-DIETHOXYETHANE

acetaldehyde⇒ETHANAL

acetaldehyde diethyl acetal ⇒1,1-DIETHOXYETHANE

ACETIC ACID (ethanoic acid) [64-19-7]

Salo <i>et al.</i> (1972)	d	26.0	9.4 % (w/w) grain spirit
Yoshida (1972)	d	6.9	nujiol (a mineral oil)
Yoshida (1972)	r	100	nujiol (a mineral oil)
Yoshida (1984);Takagi (1989)	d	100	nujol
Yoshida (1984);Takagi (1989)	r	100	nujol
Williams & Ismail (1981)		35	sugar-acid base
Guth & Grosch (1994)		32.3	0.03 M Na phosphate; pH 5.7
Reiners & Grosch (1998)	d	0.124	refined sunflower oil
Zehentbauer & Grosch (1998)		31.14	starch
Stephan & Steinhart (1999)	r	0.75	refined vegetable oil
Lee <i>et al.</i> (2000)	d	24-28	3 year old grain whisky: 23 % ethanol
Lee <i>et al.</i> (2000)	r	102-233	3 year old grain whisky: 23 % ethanol
Escudero <i>et al.</i> (2004)		300	10 % water/ethanol, tartaric acid 5 g/l, pH 3.2
Utsunomiya <i>et al.</i> (2004a)	d	36 - 37	base sake
Utsunomiya <i>et al.</i> (2004a)	r	59	base sake
Morales <i>et al.</i> (2005)	d	0.50	deodorised olive oil
Cliff & Pickering (2006)	d	3,185	base ice wine
Averbeck & Schierberle (2011)	d	12,3	citrate buffer (pH 3.8)

acetoin⇒3-HYDROXY-2-BUTANONE

acetone⇒PROPANONE

ACETOPHENONE [98-86-2]

Schirack <i>et al.</i> (2006)	d	5.629	vegetable oil
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acetovanillon⇒1-(4-HYDROXY-3-METHOXYPHENYL)ETHANONE

4-ACETYL-6-tert-BUTYL-1,1-DIMETHYLINDANE (celestolide) [13171-00-1]

D'Andrea (1975)	d	500 - 510	diethyl phthalate
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2-acetyl-3,4-dihydro-2H-azole⇒2-ACETYL-1-PYRROLINE

7-ACETYL-1,1,3,4,4,6-HEXAMETHYL-1,2,3,4-TETRAHYDRONAPHTHALENE (fixolide, tonalide) [1506-02-1]

D'Andrea (1975)	d	1.2 - 160	diethyl phthalate
Jeffcoat & Willis (1986)		100	diethyl phthalate

ACETILPYRAZINE [22047-25-2]

Schieberle (1993,1996)	d	0.01	sunflower oil
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2-ACETYL-1-PYRROLINE (2-acetyl-3,4-dihydro-2H-azole) [85213-22-5]

Schieberle (1993,1996);			
Kubickova & Grosch (1998)	d	0.000 1	sunflower oil
Rychlik & Grosch (1996); Rychlik (1998)	d	0.000 0073	starch

2-ACETYLTETRAHYDROPYRIDINE

Chetschik <i>et al.</i> (2010)		0.0012	sunflower oil
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6-ACETYL-1,2,3,4/2,3,4,5-TETRAHYDROPYRIDINE

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Rychlik & Grosch (1996)	d	0.000 054	starch
2-ACETYL-2-THIAZOLINE [29926-41-8]			
Ong & Acree (1998)		0.000 5	artificial saliva and fruit juice matrix
Kerschler (2000b)		0.0018	sunflower oil
Karagül-Yüceer <i>et al.</i> (2004)	d	0.002	skim milk
Limpawattana (2007)	d	0.0157	starch
Limpawattana (2007)	d	0.0046	partially deodorized rice at 70° C
acrolein⇒2-PROPENAL			
acrylic acid⇒PROPENOIC ACID			
active amyl acetate⇒2-METHYLBUTYL ACETATE			
active amyl alcohol⇒2-METHYL-1-BUTANOL			
adamantane⇒TRICYCLO[3.3.1.1(3.7)]DECANE			
allyl caproate⇒2-PROPENYL HEXANOATE			
4-ALLYL-1,2-DIMETHOXYBENZENE (methyleugenol, eugenol methyl ether, 4-allylveratrole) [93-15-2]			
Zea <i>et al.</i> (2001)		10	14 % (v/v) ethanol; tartaric acid to pH3.5
1-ALLYL-4-METHOXYBENZENE (estragole) [140-67-0]			
Zeller & Rychlik (2007)	r	6.3	cellulose
4-ALLYL-2-METHOXYPHENOL (eugenol) [97-53-0]			
Proetz (1924)		0.53	liq. petrolatum
Rosenthal (1927)		88	diethyl phthalate
Swan & Burtles (1978); Swan <i>et al.</i> (1981)		0.05	20 % ethanol-water
Jounela-Eriksson & Lehtonen (1981)		0.011	10 vol. % grain spirit
Etiévant <i>et al.</i> (1983)		6.4	base white sweet wine
Ophir <i>et al.</i> (1986)	d	42-81	diethyl phthalate
Gross-Isseroff & Lancet (1988)	d	0.032-320	diethyl phthalate
Ophir <i>et al.</i> (1988)	d	10.5-33.3	diethyl phthalate
Gross-Isseroff <i>et al.</i> (1992)	d	10,000	diethyl phthalate
Ferreira <i>et al.</i> (1998)		0.01	12 % v/v ethanol, 5 g/l tartaric acid, pH 3.5
Jagella & Grosch (1999b)	d	0.000 98	starch
Zimmermann (2001)	r	0.0098	starch
Moyano <i>et al.</i> (2002)		0.01	14 % (v/v) ethanol; tartaric acid to pH 3.5
Moreno <i>et al.</i> (2005);Chaves <i>et al.</i> (2007); Moyano <i>et al.</i> (2010)		0.005	14 % ethanolic solution
Campo <i>et al.</i> (2006); Escudero <i>et al.</i> (2007)		0.006	10 % water/ethanol. 5 g/l tartaric acid, pH 3.2
Ferreira <i>et al.</i> (2006)		0.158	ethanol 10% v/v, tartaric acid 2 g/l, pH 3.4
Callejón <i>et al.</i> (2008)	d	0.000 17	7 % acetic acid solution
Poisson & Schieberle (2008)		0.0071	water/ethanol 6:4 by vol.
Söllner & Schieberle (2009)		0.512	odorless sunflower oil
4-ALLYL-1,2-(METHYLENEDIOXY)BENZENE (safrole) [94-59-7]			
Rosenthal (1927)		177	diethyl phthalate
Kendall & Neilson (1964)		51	hexadecane
Kendall & Neilson (1964)		0.09	aqueous 0.1 % ethanol
Koelega & Köster (1974)		177-221	benzyl benzoate
allyl methyl sulphide⇒3-METHYLTHIO-1-PROPENE			
ALLYL SULPHOCYANATE			
Proetz (1924)		3.05	liq. Petrolatum
4-allylveratrole⇒4-ALLYL-1,2-DIMETHOXYBENZENE			
ambrettolide⇒16-HYDROXY-7-HEXADECENOIC ACID LACTONE			

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2'-AMINOACETOPHENONE [551-93-9]Karagül-Yüceer *et al.* (2004) d 0.000 4 skim milk**(R)-(+)-2-AMINO-3-MERCAPTOPROPANOIC ACID (L-cysteine) [52-90-4]**Naim *et al.* (1997) 220 orange juice

amyl acetate⇒PENTYL ACETATE

amyl alcohol⇒1-PENTANOL

amyl salicylate⇒PENTYL SALICYLATE

5,16-ANDROSTADIEN-3β-OL [1224-94-8]

Brooks & Pearson (1989) d 8.9 oil/water

4,16-ANDROSTADIEN-3-ONE ((8S,9S,10R,13R,14S)-10,13-dimethyl-1,2,6,7,8,9,11,12,14,15-decahydrocyclopenta[a]phenanthren-3-one) [4075-07-4]

Brooks & Pearson (1989) d 7.8 oil/water
 Lundström *et al.* (2003) d 57 propylene glycol
 Hummel *et al.* (2005) d 13.6 -1,360 white mineral oil
 Jacob *et al.* (2006) d 0.0018- 1,300 silicone oil
 Lundström *et al.* (2006) d 1.6 - 12.7 propylene glycol
 Chopra *et al.* (2008) [female pre-puberty] d 0.058 propylene glycol
 Chopra *et al.* (2008) [female puberty] d 0.029 propylene glycol
 Chopra *et al.* (2008) [female post-puberty] d 0.059 propylene glycol
 Chopra *et al.* (2008) [male pre-puberty] d 0.11 propylene glycol
 Chopra *et al.* (2008) [male puberty] d 0.98 propylene glycol
 Chopra *et al.* (2008) [male post-puberty] d 0.013 propylene glycol

5α-ANDROST-16-EN-3α-OL [1153-51-1]

Brooks & Pearson (1989) d 0.9 oil/water
 Morofushi *et al.* (2000) 3-30 mineral oil

5α-ANDROST-16-EN-3β-OL [7148-51-8]

Brooks & Pearson (1989) d 1.2 oil/water

5α-ANDROST-16-EN-3-ONE [18339-16-7]

Pollack *et al.* (1982) 0.5 - 1 light mineral oil
 Thomson (1984) 0.0013 aqueous ethanol
 Wysocki & Beauchamp (1984) 62.5-125 mineral oil
 Gross-Isseroff *et al.* (1987) d 2.4->1,250 heavy mineral oil
 Brooks & Pearson (1989) d 0.6 oil/water
 Dorries *et al.* (1989) 31 - 250 mineral oil
 Wysocki *et al.* (1989) *anosmic* d 125-2,000 light mineral oil
 Hummel *et al.* (1991) d 1.5-6.3 propylene glycol
 Gross-Isseroff *et al.* (1992) d 2.4->1,250 heavy mineral oil
 Pierce *et al.* (1993) r 1.95 light mineral oil
 Sather (1995) 1.9 sunflower oil
 Annor-Frempong *et al.* (1997) d 0.152 sunflower oil and vegetable oil
 Font I Furnols *et al.* (2000) d 0.10 refined sunflower oil
 Morofushi *et al.* (2000) 13-63 mineral oil
 Lübke *et al.* (2009) d 4.9 - 78 1,2-propanediol
 Lunde *et al.* (2010) 6 minced meat

anethole⇒1-METHOXY-4-(1-PROPENYL)BENZENE

anisaldehyde⇒4-METHOXYBENZALDEHYDE

m-anisaldehyde⇒3-METHOXYBENZALDEHYDE*o*-anisaldehyde⇒2-METHOXYBENZALDEHYDE

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p-anisaldehyde⇒4-METHOXYBENZALDEHYDE

azine⇒PYRIDINE

B**BENZALDEHYDE [100-52-7]**

Proetz (1924)		0.33	liq. petrolatum
Rosenthal (1927)		44	diethyl phthalate
Moncrieff (1957)		500	propylene glycol
Williams & Ismail (1981)		0.19	sugar-acid base
Delfini (1987)		3 - 3.5	white wine
Gross-Isseroff & Lancet (1988)	d	0.000 1-1,000	diethyl phthalate
Gross-Isseroff & Lancet (1988)	d	1,550	diethyl phthalate
Utsunomiya <i>et al.</i> (2004a)	d	0.97 - 0.99	base sake
Utsunomiya <i>et al.</i> (2004a)	r	1.9	base sake
Moreno <i>et al.</i> (2005)		5	14 % ethanolic solution
García-González <i>et al.</i> (2008)	d	0.06	deodorised edible oil
Tesfaye <i>et al.</i> (2008)		0.158	7 % acetic acid solution

BENZOIC ACID [65-85-0]

Culleré <i>et al.</i> (2004); Gómez-Míguez <i>et al.</i> (2007); Campo <i>et al.</i> (2006); Escudero <i>et al.</i> (2007)		1	10 % water/ethanol, tartaric acid 5 g/l, pH 3.2
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BENZYL ACETATE [140-11-4]

Rosenthal (1927)		88	diethyl phthalate
Williams & Ismail (1981)		0.3	sugar-acid base
Aceña <i>et al.</i> (2011)	d	2.3	7 % (w/v) acetic acid water volume

BENZYL ALCOHOL (phenylmethanol, α -hydroxytoluene) [100-51-6]

Rosenthal (1927)		590	diethyl phthalate
Harder (1975)		10,000	diethyl phthalate
Lindeman <i>et al.</i> (1982)	d	159	10 % ethanol
Delfini (1987)		2,300 - 2,500	white wine
Culleré <i>et al.</i> (2004); Gómez-Míguez <i>et al.</i> (2007); Escudero <i>et al.</i> (2007)		200	10 % water/ethanol, tartaric acid 5 g/l, pH 3.2
Moreno <i>et al.</i> (2005)		900	14 % ethanolic solution
Callejón <i>et al.</i> (2008)	d	16.9	7 % acetic acid solution
Aceña <i>et al.</i> (2011)	d	5.1	7 % (w/v) acetic acid water volume

benzylbenzene⇒DIPHENYLMETHANE

BENZYL BENZOATE [120-51-4]

Rosenthal (1927)		885	diethyl phthalate
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BENZYL FORMATE [104-57-4]

Rosenthal (1927)		177	diethyl phthalate
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benzyl methyl sulphide⇒ α -(METHYLTHIO)TOLUENE

bis(2-methyl-3-furyl) disulphide⇒3-(2-METHYL)FURYL-DITHIO-3-(2-METHYL)FURAN

BIS(METHYLTHIO)METHANE (2,4-dithiapentane, methylene bis(methyl sulphide)) [1618-26-4]

Adda <i>et al.</i> (1978); Cuer <i>et al.</i> (1979)	d	0.060	liquid cheese
Kubickova & Grosch (1998)		0.03	sunflower oil

borneol⇒*endo*-1,7,7-TRIMETHYLBICYCLO[2.2.1]-2-HEPTANOL(1)-borneol⇒(1S)-(-)-*endo*-1,7,7-TRIMETHYLBICYCLO[2.2.1]-2-HEPTANOL

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bornyl acetate⇒*endo*-1,7,7-TRIMETHYLBICYCLO[2.2.1]-2-HEPTYL ACETATEbourgeonal⇒3-(4-*tert*-BUTYLPHENYL)PROPANAL(1'*R*,2*R*)-brahmanol⇒(1'*R*,2*R*)-2-METHYL-4-(2,2,3-TRIMETHYL-1-CYCLOPENTEN-3-YL)-1-BUTANOL(1'*S*,2*S*)-brahmanol⇒(1'*S*,2*S*)-2-METHYL-4-(2,2,3-TRIMETHYL-1-CYCLOPENTEN-3-YL)-1-BUTANOL(1'*S*,2*R*)-brahmanol⇒(1'*S*,2*R*)-2-METHYL-4-(2,2,3-TRIMETHYL-1-CYCLOPENTEN-3-YL)-1-BUTANOL(1'*S*,2*S*)-brahmanol⇒(1'*S*,2*S*)-2-METHYL-4-(2,2,3-TRIMETHYL-1-CYCLOPENTEN-3-YL)-1-BUTANOL

bromofom⇒TRIBROMOMETHANE

1-BROMONAPHTHALENE [90-11-9]Dhont *et al.* (1972) d 0.25 'liquid sugar'**2-BROMOPHENOL [95-56-7]**

Bemelmans & Den Braber (1983) d 0.018 peanut oil

3-BROMOPHENOL [591-20-8]

Bemelmans & Den Braber (1983) d 18 peanut oil

4-BROMOPHENOL [106-41-2]

Bemelmans & Den Braber (1983) d 27 peanut oil

BUTANAL (butyraldehyde) [123-72-8]

Meijboom (1964) 0.15 paraffin oil

Salo *et al.* (1972) d 0.028 9.4 % (w/w) grain spirit**2,3-BUTANEDIOL [513-85-9]**Moreno *et al.* (2005) 668 14 % ethanolic solution**2,3-BUTANEDIONE (diacetyl) [431-03-8]**Van Niel *et al.* (1929) >2 - 4 butterSega *et al.* (1967) d 0.162 lager beerSalo (1970a); Salo *et al.* (1972) d 0.0025-0.020 9.4 % (w/w) grain spirit

Selfridge & Amerine (1978) d 0.05 artificial wine

Koch *et al.* (1978) 0.2 - 0.3 apple wine

Herrmann & Abd El Salam (1980b) 0.003 sunflower oil

Rothe (1991) 0.4 neutral margarine mass

Schieberle *et al.* (1993) 0.0045 sunflower oil

Preininger & Grosch (1994); Kubickova &

Grosch (1998); Burdack-Freitag (2007);

Buhr *et al.* (2010) 0.010 sunflower oil

Mayer (1996) 0.025 cellulose

Rychlik & Grosch (1996) d 0.0065 starch

Buettner *et al.* (1998) 0.004 2 mg/l furaneol (=200 OAV) in waterBuettner *et al.* (1998) 0.003 0.05 mg/l (Z)-3-hexenal (=200 OAV) in waterLee *et al.* (2000) d 0.002-0.02 3 year old grain whisky: 23 % ethanolLee *et al.* (2000) r 0.006-0.04 3 year old grain whisky: 23 % ethanolRogerson *et al.* (2001) r (buttery) 0.0195 20 % ethanol, tartaric acid 5g/l, pH 3.5Rogerson *et al.* (2001) r (caramel) 1.25 20 % ethanol, tartaric acid 5g/l, pH 3.5Utsunomiya *et al.* (2004a) d 0.08 - 0.083 base sakeUtsunomiya *et al.* (2004a) r 0.14 base sakeMoreno *et al.* (2005); Chaves *et al.* (2007);Moyano *et al.* (2010) 0.1 14 % ethanolic solutionCallejón *et al.* (2008) d 0.040 7 % acetic acid solution

Leksrisompong (2008);

Leksrisompong *et al.* (2010) d 0.0408 water with 1 % caseinate, pH 7.0

Leksrisompong (2008);

Leksrisompong *et al.* (2010) d 0.0449 water with 1 % caseinate, pH 5.5

Leksrisompong (2008);

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Leksrisompong <i>et al.</i> (2010)	d	0.0056	emulsion with 10 % fat, pH 7.0
Leksrisompong (2008); Leksrisompong <i>et al.</i> (2010)	d	0.0092	emulsion with 10 % fat, pH 5.5
Leksrisompong (2008); Leksrisompong <i>et al.</i> (2010)	d	0.0218	emulsion with 20 % fat, pH 7.0
Leksrisompong (2008); Leksrisompong <i>et al.</i> (2010)	d	0.0086	emulsion with 20 % fat, pH 5.5
Leksrisompong (2008); Leksrisompong <i>et al.</i> (2010)	d	0.0995	oil
Poisson & Schieberle (2008)		0.0028	water/ethanol 6:4 by vol.
Buhr <i>et al.</i> (2010)	d	0.050	whole milk
Aceña <i>et al.</i> (2011)	d	0.0953	7 % (w/v) acetic acid water volume
BUTANOIC ACID (butyric acid) [107-92-6]			
Salo (1970a,1970b); Salo <i>et al.</i> (1972)	d	3.4/4	9.4 % (w/w) grain spirit
Baldwin <i>et al.</i> (1973)	r	0.3	buffered solution pH 3.2
Baldwin <i>et al.</i> (1973)	r	0.9	buffered solution pH 4.5
Baldwin <i>et al.</i> (1973)	r	4.8	buffered solution pH 6.0
Amoore & Buttery (1978)	d	0.109	safflower oil
Haslbeck <i>et al.</i> (1986)		44 - 56	cream
Haslbeck <i>et al.</i> (1986)		17 - 49	30 % coconut oil
Haslbeck <i>et al.</i> (1986)		53 - 210	38 % coconut oil aromatized
Schieberle <i>et al.</i> (1993)		0.135	sunflower oil
Guth & Grosch (1994); Kerschler & Grosch (2000)		2.73	0.03 M Na phosphate; pH 5.7
Rychlik & Grosch (1996)	d	0.1	starch
Stephan & Steinhart (1999)	r	0.205	refined vegetable oil
Moyano <i>et al.</i> (2002)		2.5	14 % (v/v) ethanol; tartaric acid to pH 3.5
Karagül-Yüceer <i>et al.</i> (2004)	d	3.09	skim milk
Utsunomiya <i>et al.</i> (2004a)	d	4.3	base sake
Utsunomiya <i>et al.</i> (2004a)	r	7.9 - 8	base sake
Morales <i>et al.</i> (2005); García-González <i>et al.</i> (2008)	d	0.14/0.65	deodorised olive/edible oil
Moreno <i>et al.</i> (2005); Moyano <i>et al.</i> (2010)		10	14 % ethanolic solution
Steinhaus & Schieberle (2005)	r	7.5	starch with 12 white pepper odorants
Rychlik <i>et al.</i> (2006)		3.54	fresh yoghurt with 3.04 mg/kg butanoic acid
Rychlik <i>et al.</i> (2006)		1.73	three-month-old yoghurt with 4.89 mg/kg butanoic acid
Averbeck & Schieberle (2011)	d	0.145	citrate buffer (pH 3.8)
1-BUTANOL (butyl alcohol) [71-36-3]			
Furchtgott & Friedman (1960)		3,112-4,076	mineral oil
Kimbrell & Furchtgott (1963)	d	1,000-60,000	mineral oil
Cain (1966)	r	2,380	diethyl phthalate
Semb (1968)		100-5,000	diethyl phthalate
Salo <i>et al.</i> (1972)	d	>5.0	9.4 % (w/w) grain spirit
Granzer <i>et al.</i> (1986)		10 - 200	coconut oil
Moyano <i>et al.</i> (2002)		160	14 % (v/v) ethanol; tartaric acid to pH 3.5
Moreno <i>et al.</i> (2005)		820	14 % ethanolic solution
García-González <i>et al.</i> (2008)	d	0.038	deodorised edible oil
2-BUTANOL (sec-butyl alcohol) [78-92-2]			
Salo <i>et al.</i> (1972)	d	>10.0	9.4 % (w/w) grain spirit
Zea <i>et al.</i> (2001); Moyano <i>et al.</i> (2002)		50	14 % (v/v) ethanol; tartaric acid to pH 3.5
Morales <i>et al.</i> (2005)	d	0.10/0.15	deodorised olive oil
Moreno <i>et al.</i> (2005)		1,000	14 % ethanolic solution
García-González <i>et al.</i> (2008)	d	0.50	deodorised edible oil