

## Lipid Standards

### Compounds of Biochemical Interest

ULTRA Scientific manufactures and stocks a large number of lipids of interest in the analytical laboratory. All of these materials are manufactured under ULTRA's ISO 9001 quality system. A certificate showing the purity of the compound is available for each standard.

Compound classes include:

- ✓ straight-chain fatty acids and methyl esters
- ✓ branched-chain fatty acids and methyl esters
- ✓ unsaturated fatty acids and methyl esters
- ✓ straight-chain fatty alcohols
- ✓ fatty acid and methyl ester kits



### Working With Small Quantities

When neat chemical standards are packaged in very small quantities (100 milligrams or less), the volume of chemical contained in the vial is very small compared to the size of the vial. For example, 5 milligrams of a liquid PCB occupies about 4.2 microliters of volume. Thus it is difficult to remove the material from the vial without wasting some of it.

To avoid this problem, ULTRA Scientific uses analytical balances and strict weigh tolerances to dispense these materials. The actual amount of material contained in the vial is never less than the stated value, nor more than 1% higher than the stated value. Thus, the analyst can simply rinse the material out of the vial using an appropriate solvent, and still be assured of the amount dispensed.

## Ordering Is Easy

### Online

www.ultrasci.com  
ultra@ultrasci.com

### Phone

800-338-1754  
Monday – Friday  
8:30 a.m. - 5:00 p.m. ET

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### Mail

ULTRA Scientific  
250 Smith Street  
No. Kingstown, RI  
02852



## Lipids

## Lipid Standards

99% Pure

Compound	CAS #	Catalog #	Unit Size	Price
acetic acid ( <i>ethanoic acid</i> )	64-19-7	FLSA-001	1 gm	***
acetic acid methyl ester ( <i>methyl acetate</i> )	79-20-9	FLSA-016	1 gm	***
adipic acid	<i>see hexanedioic acid</i>			
arachidic acid	<i>see eicosanoic acid</i>			
arachidonic acid	506-32-1	FLSA-098	100 mg	***
arachidonic acid methyl ester	2566-89-4	FLSA-107	100 mg	***
azelaic acid	<i>see nonanedioic acid</i>			
behenic acid	<i>see docosanoic acid</i>			
butanedioic acid ( <i>succinic acid</i> )	110-15-6	FLSA-115	1 gm	***
butanedioic acid dimethyl ester	106-65-0	FLSA-132	1 gm	***
butanoic acid ( <i>butyric acid</i> )	107-92-6	FLSA-002	1 gm	***
butanoic acid methyl ester	623-42-7	FLSA-017	1 gm	***
capric acid	<i>see decanoic acid</i>			
caproic acid	<i>see hexanoic acid</i>			
caprylic acid	<i>see octanoic acid</i>			
cerotic acid	<i>see hexacosanoic acid</i>			
decanedioic acid ( <i>sebacic acid</i> )	111-20-6	FLSA-121	500 mg	***
decanedioic acid dimethyl ester	110-40-7	FLSA-138	500 mg	***
decanoic acid ( <i>capric acid</i> )	334-48-5	FLSA-005	1 gm	***
decanoic acid methyl ester	110-42-9	FLSA-020	1 gm	***
docosahexenoic acid (98%)	6217-54-5	FLSA-100	100 mg	***
docosahexenoic acid methyl ester	301-01-9	FLSA-109	100 mg	***
docosanoic acid ( <i>behenic acid</i> )	112-85-6	FLSA-011	1 gm	***
docosanoic acid methyl ester	929-77-1	FLSA-026	1 gm	***
1-docosanol ( <i>behenyl alcohol</i> )	661-19-8	FLMS-018	100 mg	***
dodecanoic acid ( <i>lauric acid</i> )	143-07-7	FLSA-006	1 gm	***
dodecanoic acid methyl ester	111-82-0	FLSA-021	1 gm	***
11,14-eicosadienoic acid	2091-39-6	FLSA-091	100 mg	***
11,14-eicosadienoic acid methyl ester	2/7/2463	FLSA-094	100 mg	***
eicosanoic acid ( <i>arachidic acid</i> )	506-30-9	FLSA-010	1 gm	***
eicosanoic acid methyl ester	1120-28-1	FLSA-025	1 gm	***
1-eicosanol ( <i>arachidyl alcohol</i> )	629-96-9	FLMS-016	500 mg	***
11,14,17-eicosatrienoic acid	2091-27-2	FLSA-097	100 mg	***
11,14,17-eicosatrienoic acid methyl ester	55682-88-7	FLSA-106	100 mg	***
11-eicosenoic acid	5561-99-9	FLSA-072	100 mg	***
11-eicosenoic acid methyl ester	9/2/2390	FLSA-086	100 mg	***
elaidic acid	112-79-8	FLSA-066	100 mg	***
elaidic acid methyl ester	2462-84-2	FLSA-080	100 mg	***
erucic acid	112-86-7	FLSA-073	100 mg	***
erucic acid methyl ester	1120-34-9	FLSA-087	100 mg	***
ethanedioic acid ( <i>oxalic acid</i> )	144-62-7	FLSA-113	1 gm	***
ethanedioic acid dimethyl ester	553-90-2	FLSA-130	1 gm	***
ethanoic acid ( <i>acetic acid</i> )	<i>see acetic acid</i>			
formic acid ( <i>methanoic acid</i> )	64-18-6	FLSA-031	1 gm	***
formic acid methyl ester ( <i>methyl formate</i> )	107-31-3	FLSA-046	1 gm	***
hendecanoic acid ( <i>undecylic acid</i> )	112-37-8	FLSA-036	100 mg	***
hendecanoic acid methyl ester	1731-86-8	FLSA-051	100 mg	***
heneicosanoic acid	2363-71-5	FLSA-041	100 mg	***
heneicosanoic acid methyl ester	6064-90-0	FLSA-056	100 mg	***
1-heneicosanol	15594-90-8	FLMS-017	100 mg	***
heptacosanoic acid methyl ester	55682-91-2	FLSA-059	50 mg	***
1-heptacosanol	2004-39-9	FLMS-023	50 mg	***

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99% Pure

Compound	CAS #	Catalog #	Unit Size	Price
heptadecanoic acid ( <i>margaric acid</i> )	506-12-7	FLSA-039	100 mg	***
heptadecanoic acid methyl ester	1731-92-6	FLSA-054	100 mg	***
1-heptadecanol	1454-85-9	FLMS-013	100 mg	***
heptanedioic acid ( <i>pimelic acid</i> )	111-16-0	FLSA-118	1 gm	***
heptanedioic acid dimethyl ester	1732-08-7	FLSA-135	1 gm	***
heptanoic acid ( <i>heptylic acid</i> )	111-14-8	FLSA-034	100 mg	***
heptanoic acid methyl ester	106-73-0	FLSA-049	100 mg	***
<i>heptylic acid</i>	<i>see heptanoic acid</i>			
hexacosanoic acid ( <i>cerotic acid</i> )	506-46-7	FLSA-013	100 mg	***
hexacosanoic acid methyl ester	5802-82-4	FLSA-028	100 mg	***
1-hexacosanol ( <i>cerotyl alcohol</i> )	506-52-5	FLMS-022	50 mg	***
hexadecanoic acid ( <i>palmitic acid</i> )	57-10-3	FLSA-008	1 gm	***
hexadecanoic acid methyl ester	112-39-0	FLSA-023	1 gm	***
1-hexadecanol ( <i>cetyl alcohol</i> )	36653-82-4	FLMS-012	1 gm	***
hexanedioic acid ( <i>adipic acid</i> )	124-04-9	FLSA-117	1 gm	***
hexanedioic acid dimethyl ester	627-93-0	FLSA-134	1 gm	***
hexanoic acid ( <i>caproic acid</i> )	142-62-1	FLSA-003	1 gm	***
hexanoic acid methyl ester	106-70-7	FLSA-018	1 gm	***
<i>isoarachidic acid</i>	<i>see 18-methylnonadecanoic acid</i>			
<i>isocaproic acid</i>	<i>see 8-methylnonanoic acid</i>			
<i>isocaproic acid</i>	<i>see 4-methylpentanoic acid</i>			
<i>isocaprylic acid</i>	<i>see 6-methylheptanoic acid</i>			
<i>isolauric acid</i>	<i>see 10-methylhendecanoic acid</i>			
<i>isopalmitic acid</i>	<i>see 14-methylpentadecanoic acid</i>			
<i>isostearic acid</i>	<i>see 16-methylheptadecanoic acid</i>			
<i>lauric acid</i>	<i>see dodecanoic acid</i>			
<i>lignoceric acid</i>	<i>see tetracosanoic acid</i>			
linoleic acid	60-33-3	FLSA-089	100 mg	***
linoleic acid methyl ester	112-63-0	FLSA-092	100 mg	***
linolelaidic acid	506-21-8	FLSA-090	100 mg	***
linolelaidic acid methyl ester	2566-97-4	FLSA-093	100 mg	***
linolenic acid	463-40-1	FLSA-095	100 mg	***
linolenic acid methyl ester	301-00-8	FLSA-104	100 mg	***
$\gamma$ -linolenic acid	506-26-3	FLSA-096	100 mg	***
$\gamma$ -linolenic acid methyl ester	16326-32-2	FLSA-105	100 mg	***
homo $\gamma$ -linolenic acid	1783-84-2	FLSA-147	100 mg	***
homo $\gamma$ -linolenic acid methyl ester	21061-10-9	FLSA-148	100 mg	***
<i>malonic acid</i>	<i>see propanedioic acid</i>			
<i>margaric acid</i>	<i>see heptadecanoic acid</i>			
<i>mellissic acid</i>	<i>see triacontanoic acid</i>			
<i>methanoic acid</i>	<i>see formic acid</i>			
<i>methyl acetate</i>	<i>see acetic acid methyl ester</i>			
2-methylbutanoic acid ( <i>anteisovaleric acid</i> )	116-53-0	FLBA-021	50 mg	***
2-methylbutanoic acid methyl ester	868-57-5	FLBA-030	50 mg	***
10-methyldodecanoic acid methyl ester	-	FLBA-034	50 mg	***
18-methyleicosanoic acid methyl ester	-	FLBA-038	25 mg	***
10-methylhendecanoic acid ( <i>isolauric acid</i> )	2724-56-3	FLBA-004	50 mg	***
10-methylhendecanoic acid methyl ester	-	FLBA-014	50 mg	***
16-methylheptadecanoic acid ( <i>isostearic acid</i> )	2724-58-5	FLBA-007	10 mg	***
16-methylheptadecanoic acid methyl ester	5129-61-3	FLBA-017	10 mg	***
6-methylheptanoic acid ( <i>isocaprylic acid</i> )	929-10-2	FLBA-002	50 mg	***
6-methylheptanoic acid methyl ester	-	FLBA-012	50 mg	***

continued

## Lipids

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99% Pure

Compound	CAS #	Catalog #	Unit Size	Price
14-methylhexadecanoic acid ( <i>anteisomargaric acid</i> )	5918-29-6	FLBA-027	10 mg	***
14-methylhexadecanoic acid methyl ester	2490-49-5	FLBA-036	10 mg	***
4-methylhexanoic acid ( <i>anteisoheptylic acid</i> )	-	FLBA-022	50 mg	***
4-methylhexanoic acid methyl ester	-	FLBA-031	50 mg	***
18-methylnonadecanoic acid ( <i>isoarachidic acid</i> )	6250-72-2	FLBA-008	25 mg	***
18-methylnonadecanoic acid methyl ester	65301-91-9	FLBA-018	25 mg	***
8-methylnonanoic acid ( <i>isocapric acid</i> )	5963-14-4	FLBA-003	50 mg	***
8-methylnonanoic acid methyl ester	-	FLBA-013	50 mg	***
16-methyloctadecanoic acid ( <i>anteisononadecylic acid</i> )	-	FLBA-028	25 mg	***
16-methyloctadecanoic acid methyl ester	-	FLBA-037	25 mg	***
6-methyloctanoic acid methyl ester	-	FLBA-032	50 mg	***
14-methylpentadecanoic acid ( <i>isopalmitic acid</i> )	2/7/4669	FLBA-006	10 mg	***
14-methylpentadecanoic acid methyl ester	5129-60-2	FLBA-016	10 mg	***
4-methylpentanoic acid ( <i>isocaproic acid</i> )	646-07-1	FLBA-001	50 mg	***
4-methylpentanoic acid methyl ester	2412-80-8	FLBA-011	50 mg	***
<i>methyl phytanate</i>	<i>see phytanic acid methyl ester</i>			
12-methyltetradecanoic acid ( <i>anteisopentadecylic acid</i> )	5502-94-3	FLBA-026	10 mg	***
12-methyltetradecanoic acid methyl ester	-	FLBA-035	10 mg	***
12-methyltridecanoic acid methyl ester	5129-58-8	FLBA-015	10 mg	***
<i>montanic acid</i>	<i>see octacosanoic acid</i>			
<i>myristic acid</i>	<i>see tetradecanoic acid</i>			
myristoleic acid	544-64-9	FLSA-062	100 mg	***
myristoleic acid methyl ester	124-10-7	FLSA-076	100 mg	***
nervonic acid	506-37-6	FLSA-074	100 mg	***
nervonic acid methyl ester	2733-88-2	FLSA-088	100 mg	***
nonadecanoic acid ( <i>nonadecylic acid</i> )	646-30-0	FLSA-040	100 mg	***
nonadecanoic acid methyl ester	1731-94-8	FLSA-055	100 mg	***
1-nonadecanol	1454-84-8	FLMS-015	100 mg	***
<i>nonadecylic acid</i>	<i>see nonadecanoic acid</i>			
nonanedioic acid ( <i>azelaic acid</i> )	123-99-9	FLSA-120	500 mg	***
nonanedioic acid dimethyl ester	1732-10-1	FLSA-137	500 mg	***
nonanoic acid ( <i>pelargonic acid</i> )	112-05-0	FLSA-035	100 mg	***
nonanoic acid methyl ester	1731-84-6	FLSA-050	100 mg	***
octacosanoic acid ( <i>montanic acid</i> )	506-48-9	FLSA-014	100 mg	***
octacosanoic acid methyl ester	55682-92-3	FLSA-029	100 mg	***
1-octacosanol ( <i>montanyl alcohol</i> )	557-61-9	FLMS-024	50 mg	***
octadecanedioic acid	871-70-5	FLSA-127	50 mg	***
octadecanedioic acid dimethyl ester	1472-93-1	FLSA-144	50 mg	***
octadecanoic acid ( <i>stearic acid</i> )	57-11-4	FLSA-009	1 gm	***
octadecanoic acid methyl ester	112-61-8	FLSA-024	1 gm	***
1-octadecanol ( <i>stearyl alcohol</i> )	112-92-5	FLMS-014	1 gm	***
<i>cis</i> -11-octadecenoic acid	506-17-2	FLSA-067	100 mg	***
<i>cis</i> -11-octadecenoic acid methyl ester	1937-63-9	FLSA-081	100 mg	***
<i>trans</i> -11-octadecenoic acid ( <i>vaccenic acid</i> )	693-72-1	FLSA-068	100 mg	***
<i>trans</i> -11-octadecenoic acid methyl ester	6198-58-9	FLSA-082	100 mg	***
octanedioic acid ( <i>suberic acid</i> )	505-48-6	FLSA-119	500 mg	***
octanedioic acid dimethyl ester	1732-09-8	FLSA-136	500 mg	***
octanoic acid ( <i>caprylic acid</i> )	124-07-2	FLSA-004	1 gm	***
octanoic acid methyl ester	111-11-5	FLSA-019	1 gm	***
oleic acid	112-80-1	FLSA-065	100 mg	***
oleic acid methyl ester	112-62-9	FLSA-079	100 mg	***
<i>oxalic acid</i>	<i>see ethanedioic acid</i>			

## Lipids

## Lipid Standards

99% Pure

Compound	CAS #	Catalog #	Unit Size	Price
palmitelaidic acid	10030-73-6	FLSA-064	100 mg	***
palmitelaidic acid methyl ester	10030-74-7	FLSA-078	100 mg	***
<i>palmitic acid</i>	<i>see hexadecanoic acid</i>			
palmitoleic acid	373-49-9	FLSA-063	100 mg	***
palmitoleic acid methyl ester	1120-25-8	FLSA-077	100 mg	***
<i>pelargonic acid</i>	<i>see nonanoic acid</i>			
pentacosanoic acid methyl ester	55373-89-2	FLSA-058	50 mg	***
1-pentacosanol	26040-98-2	FLMS-021	50 mg	***
pentadecanoic acid ( <i>pentadecylic acid</i> )	1002-84-2	FLSA-038	100 mg	***
pentadecanoic acid methyl ester	7132-64-1	FLSA-053	100 mg	***
<i>pentadecylic acid</i>	<i>see pentadecanoic acid</i>			
pentanoic acid ( <i>valeric acid</i> )	109-52-4	FLSA-033	100 mg	***
pentanoic acid methyl ester	624-24-8	FLSA-048	100 mg	***
petroselinic acid	593-39-5	FLSA-071	100 mg	***
petroselinic acid methyl ester	2777-58-4	FLSA-085	100 mg	***
phytanic acid ( <i>3,7,11,15-tetramethylhexadecanoic acid</i> )	14721-66-5	FLBA-042	25 mg	***
phytanic acid methyl ester ( <i>methyl phytanate</i> )	1118-77-0	FLBA-043	25 mg	***
phytol ( <i>3,7,11,15-tetramethyl-2-hexadecen-1-ol</i> ) (tech)	7541-49-3	FLMS-035	1 gm	***
<i>pimelic acid</i>	<i>see heptanedioic acid</i>			
propanedioic acid ( <i>malonic acid</i> )	141-82-2	FLSA-114	1 gm	***
propanedioic acid dimethyl ester	108-59-8	FLSA-131	1 gm	***
propanoic acid ( <i>propionic acid</i> )	79-09-4	FLSA-032	1 gm	***
propanoic acid methyl ester	554-12-1	FLSA-047	1 gm	***
ricinelaidic acid	82188-83-8	FLSA-070	100 mg	***
ricinelaidic acid methyl ester	7706-01-6	FLSA-084	100 mg	***
ricinoleic acid	141-22-0	FLSA-069	100 mg	***
ricinoleic acid methyl ester	141-24-2	FLSA-083	100 mg	***
<i>sebacic acid</i>	<i>see decanedioic acid</i>			
<i>stearic acid</i>	<i>see octadecanoic acid</i>			
<i>suberic acid</i>	<i>see octanedioic acid</i>			
<i>succinic acid</i>	<i>see butanedioic acid</i>			
tetracosanoic acid ( <i>lignoceric acid</i> )	557-59-5	FLSA-012	100 mg	***
tetracosanoic acid methyl ester	2442-49-1	FLSA-027	100 mg	***
1-tetracosanol ( <i>lignoceryl alcohol</i> )	506-51-4	FLMS-020	50 mg	***
tetradecanedioic acid	821-38-5	FLSA-125	100 mg	***
tetradecanedioic acid dimethyl ester	5024-21-5	FLSA-142	100 mg	***
tetradecanoic acid ( <i>myristic acid</i> )	544-63-8	FLSA-007	1 gm	***
tetradecanoic acid methyl ester	124-10-7	FLSA-022	1 gm	***
1-tetradecanol ( <i>myristyl alcohol</i> )	112-72-1	FLMS-010	1 gm	***
<i>3,7,11,15-tetramethylhexadecanoic acid</i>	<i>see phytanic acid</i>			
<i>3,7,11,15-tetramethyl-2-hexadecen-1-ol</i>	<i>see phytol</i>			
triacontanoic acid ( <i>mellisic acid</i> )	506-50-3	FLSA-015	100 mg	***
triacontanoic acid methyl ester	629-83-4	FLSA-030	100 mg	***
1-triacontanol ( <i>melissyl alcohol</i> )	593-50-0	FLMS-026	50 mg	***
tricosanoic acid methyl ester	2433-97-8	FLSA-057	100 mg	***
1-tricosanol	3133-01-5	FLMS-019	100 mg	***
tridecanoic acid ( <i>tridecylic acid</i> )	638-53-9	FLSA-037	100 mg	***
tridecanoic acid methyl ester	1731-88-0	FLSA-052	100 mg	***
<i>tridecylic acid</i>	<i>see tridecanoic acid</i>			
<i>undecylic acid</i>	<i>see hendecanoic acid</i>			
<i>vaccenic acid</i>	<i>see trans-11-octadecenoic acid</i>			
<i>valeric acid</i>	<i>see pentanoic acid</i>			

continued

## Lipid Kits

## Even Carbon Straight Chain Fatty Acids and Methyl Esters Kit

Kit - contains twenty vials:

1 x 100 mg of each compound listed below

	Fatty Acids	Methyl Esters
C <sub>6</sub>	caproic acid	methyl caproate
C <sub>8</sub>	caprylic acid	methyl caprylate
C <sub>10</sub>	capric acid	methyl caprate
C <sub>12</sub>	lauric acid	methyl laurate
C <sub>14</sub>	myristic acid	methyl myristate
C <sub>16</sub>	palmitic acid	methyl palmitate
C <sub>18</sub>	stearic acid	methyl stearate
C <sub>20</sub>	arachidic acid	methyl arachidate
C <sub>22</sub>	behenic acid	methyl behenate
C <sub>24</sub>	lignoceric acid (25 mg)	methyl lignocerate (25 mg)

FLPK-004

Kit

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## Odd Carbon Straight Chain Fatty Acids And Methyl Esters Kit

Kit - contains sixteen vials:

1 x 25 mg of each compound listed below

	Fatty Acids	Methyl Esters
C <sub>9</sub>	nonanoic acid	methyl nonanoate
C <sub>11</sub>	undecanoic acid	methyl undecanoate
C <sub>13</sub>	tridecanoic acid	methyl tridecanoate
C <sub>15</sub>	pentadecanoic acid	methyl pentadecanoate
C <sub>17</sub>	heptadecanoic acid	methyl heptadecanoate
C <sub>19</sub>	nonadecanoic acid	methyl nonadecanoate
C <sub>21</sub>	heneicosanoic acid	methyl heneicosanoate
C <sub>23</sub>	tricosanoic acid	methyl tricosanoate

FLPK-003

Kit

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## Volatile Fatty Acids Kit

Kit - contains eleven vials:

1 x 1 gm of each compound listed below

C <sub>1</sub>	formic acid	(methanoic acid)
C <sub>2</sub>	acetic acid	(ethanoic acid)
C <sub>3</sub>	propionic acid	(propanoic acid)
C <sub>4</sub>	butyric acid	(butanoic acid)
C <sub>4</sub>	isobutyric acid	
C <sub>5</sub>	valeric acid	(pentanoic acid)
C <sub>5</sub>	isovaleric acid	
C <sub>6</sub>	caproic acid	(hexanoic acid)
C <sub>7</sub>	heptylic acid	(heptanoic acid)
C <sub>8</sub>	caprylic acid	(octanoic acid)

plus

1 x 5 mL ampule of

0.1% C1 -C5 Acids Test Solution in H<sub>2</sub>O

FLPK-005

Kit

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## Unsaturated Fatty Acids and Methyl Esters Kit

Kit - contains twenty vials:

1 x 25 mg of each compound listed below

## Fatty Acids

C <sub>14</sub> <sup>1=</sup>	<i>cis</i> -9-tetradecenoic acid ( <i>myristoleic acid</i> )
C <sub>16</sub> <sup>1=</sup>	<i>cis</i> -9-hexadecenoic acid ( <i>palmitoleic acid</i> )
C <sub>16</sub> <sup>1=</sup>	<i>trans</i> -9-hexadecenoic acid ( <i>palmitelaidic acid</i> )
C <sub>18</sub> <sup>1=</sup>	<i>cis</i> -9-octadecenoic acid ( <i>oleic acid</i> )
C <sub>18</sub> <sup>1=</sup>	<i>trans</i> -9-octadecenoic acid ( <i>elaidic acid</i> )
C <sub>18</sub> <sup>2=</sup>	<i>cis</i> -9- <i>cis</i> -12-octadecadienoic acid ( <i>linoleic acid</i> )
C <sub>18</sub> <sup>2=</sup>	<i>trans</i> -9- <i>trans</i> -12-octadecadienoic acid ( <i>linolelaidic acid</i> )
C <sub>18</sub> <sup>3=</sup>	<i>cis</i> -9- <i>cis</i> -12- <i>cis</i> -15-octadecatrienoic acid ( <i>linolenic acid</i> )
C <sub>20</sub> <sup>1=</sup>	<i>cis</i> -11-eicosenoic acid ( <i>gondonic acid</i> )
C <sub>22</sub> <sup>1=</sup>	<i>cis</i> -13-docosenoic acid ( <i>erucic acid</i> )

## Methyl Esters

C <sub>14</sub> <sup>1=</sup>	methyl <i>cis</i> -9-tetradecenoate ( <i>methyl myristoleate</i> )
C <sub>16</sub> <sup>1=</sup>	methyl <i>cis</i> -9-hexadecenoate ( <i>methyl palmitoleate</i> )
C <sub>16</sub> <sup>1=</sup>	methyl <i>trans</i> -9-hexadecenoate ( <i>methyl palmitelaidate</i> )
C <sub>18</sub> <sup>1=</sup>	methyl <i>cis</i> -9-octadecenoate ( <i>methyl oleate</i> )
C <sub>18</sub> <sup>1=</sup>	methyl <i>trans</i> -9-octadecenoate ( <i>methyl elaidate</i> )
C <sub>18</sub> <sup>2=</sup>	methyl <i>cis</i> -9- <i>cis</i> -12-octadecadienoate ( <i>methyl linoleate</i> )
C <sub>18</sub> <sup>2=</sup>	methyl <i>trans</i> -9- <i>cis</i> -12-octadecadienoate ( <i>methyl linolelaidate</i> )
C <sub>18</sub> <sup>3=</sup>	methyl <i>cis</i> -9- <i>cis</i> -12- <i>cis</i> -15-octadecatrienoate ( <i>methyl linolenate</i> )
C <sub>20</sub> <sup>1=</sup>	methyl <i>cis</i> -11-eicosenoate ( <i>methyl gondonate</i> )
C <sub>22</sub> <sup>1=</sup>	methyl <i>cis</i> -13-docosenoate ( <i>methyl erucate</i> )

FLPK-001

Kit

\*\*\*

## Hydrocarbons and Terpenes

### ULTRAKits®

#### Kits for Qualitative Measurements

Each ULTRAKit contains 2 mL each of twenty different standards in a convenient plastic box. Solid compounds are dissolved in an appropriate solvent. All standards are packaged in screw-capped vials, and are 98+% pure. These kits are manufactured under ULTRA's ISO 9001 quality system. However, no certificates of analysis are available.



#### Hydrocarbons #1

*n*-hexane  
*n*-heptane  
*n*-octane  
*n*-nonane  
*n*-decane  
*n*-undecane  
*n*-dodecane  
*n*-tetradecane  
*n*-hexadecane  
*n*-octadecane †  
 hexene-1  
 heptene-1  
 octene-1  
 nonene-1  
 decene-1  
 undecene-1  
 dodecene-1  
 tetradecene-1  
 hexadecene-1  
 octadecene-1

† @ 10% w/v in Chloroform

WRK-100

\*\*\*

#### Hydrocarbons #2

##### (Wax Range)

hexadecane  
 heptadecane  
 octadecane  
 nonadecane  
 pristane  
 eicosane  
 heneicosane  
 docosane  
 tricosane  
 tetracosane  
 pentacosane  
 hexacosane  
 octacosane  
 triacontane  
 squalane  
 dotriacontane  
 tetratriacontane  
 hexatriacontane  
 octatriacontane  
 tetracontane

@ 1% w/v in Tetradecane

WRK-101

\*\*\*

#### Hydrocarbons #3

##### (Gasoline Range)

*n*-hexane  
*n*-heptane  
*n*-octane  
 isooctane  
*n*-nonane  
 cyclopentane  
 methylcyclopentane  
 cyclohexane  
 methylcyclohexane  
 dimethylcyclohexane  
 hexene-1  
 heptene-1  
 octene-1  
 diisobutylene  
 nonene-1  
 benzene  
 toluene  
 xylenes (mixed)  
 cumene  
 mesitylene

WRK-102

\*\*\*

#### Hydrocarbons #4

##### (Branched Chain)

2-methylpentane  
 3-methylpentane  
 2,2-dimethylbutane  
 2,3-dimethylbutane  
 3-methylhexane  
 2,3-dimethylpentane  
 2,4-dimethylpentane  
 2,2,4-trimethylpentane  
 2,3,4-trimethylpentane  
 3-methylpentadiene-1,3  
 2-methylpentene-1  
 4-methylpentene-2  
 4-methylpentene-1  
 2-ethylhexene-1  
 2-methylheptene-3  
 2,4,4-trimethylpentene-1  
 2,4,4-trimethylpentene-2  
 3,5,5-trimethylhexene-1  
 2,5-dimethylhexadiene-2,4

WRK-103

\*\*\*

#### Hydrocarbons #5

##### (Cyclic Hydrocarbons)

cyclopentane  
 methylcyclopentane  
 cyclopentene  
 cyclohexane  
 methylcyclohexane  
 1,2-dimethylcyclohexane  
 1,4-dimethylcyclohexane  
 ethylcyclohexane  
 isopropylcyclohexane  
 phenylcyclohexane  
 cyclohexene  
 4-methylcyclohexene  
 4-vinylcyclohexene  
 cycloheptane  
 cycloheptene  
 cyclooctane  
 cyclooctene  
 1,5-cyclooctadiene  
 1,3-cyclooctadiene  
 dicyclopentadiene

WRK-104

\*\*\*

#### Terpenes

$\alpha$ -pinene †  
 $\beta$ -pinene †  
 fenchone †  
 geraniol †  
 $\alpha$ -terpinene †  
 $\gamma$ -terpinene †  
 camphene †  
 linalool †  
*d*-limonene †  
 citral †  
 myrcene ‡  
 $\alpha$ -terpineol †  
 citronellol †  
*d*-menthol †  
 1-borneol †  
 2-piperidone †  
 dihydrocarveol †  
 1-isopulegol †  
 pulegone †

† 2% w/v in Ethanol

‡ 2% w/v in Chloroform

WRK-105

\*\*\*

## Aromatics, Industrial Chemicals, and Solvents

## Aromatics #1

benzene  
 toluene  
*o*-xylene  
*m*-xylene  
*p*-xylene  
 ethylbenzene  
 propylbenzene  
 cumene  
 butylbenzene  
 isobutylbenzene  
*sec*-butylbenzene  
*tert*-butylbenzene  
*p*-cymene  
 1,2,4-trimethylbenzene  
 mesitylene  
*p*-diisopropylbenzene  
 1,2,4,5-tetramethylbenzene †  
 styrene  
 $\alpha$ -methylstyrene  
 $\beta$ -methylstyrene

† @ 2% w/v in *p*-Xylene

WRK-110

\*\*\*

## Aromatics #2

benzene  
 toluene  
*o*-xylene  
*m*-xylene  
*p*-xylene  
 biphenyl †  
 bibenzyl †  
 diphenylmethane †  
 naphthalene †  
 1-methylnaphthalene †  
 2-methylnaphthalene †  
 indane  
 indene  
 anthracene ‡  
 pyrene †  
 tetralin  
 decalin  
 fluorene †  
 1,2-dimethylnaphthalene †  
 phenanthrene †

† @ 2% w/v in *p*-Xylene‡ @ 1% w/v in *p*-Xylene

WRK-111

\*\*\*

## Aromatics #3

## (Polycyclic Aromatics)

acenaphthylene †  
 acenaphthene †  
 anthracene †  
 azulene †  
 1,2-benzanthracene †  
 2,3-benzofluorene †  
 chrysene ‡  
 benzo[a]pyrene †  
 9,10-dimethylantracene †  
 1,2-dimethylnaphthalene †  
 fluoranthene †  
 fluorene †  
 2-methylantracene †  
 naphthalene †  
 perylene ‡  
 phenanthrene †  
 pyrene †  
*cis*-stilbene †  
*trans*-stilbene †

† @ 1% w/v in Toluene

‡ @ 0.5% w/v in Chloroform

WRK-112

\*\*\*

## Chemical Solvents

acetone  
 benzene  
 carbon tetrachloride  
 dimethyl formamide  
 dimethyl sulfoxide  
 ethyl acetate  
 furfural  
 gasoline  
 isooctane  
 isopropyl alcohol  
 kerosene  
 methanol  
 methyl ethyl ketone  
 naphtha  
 nitrobenzene  
 tetrahydrofuran  
 toluene  
 trichloroethylene  
 turpentine  
 xylenes (mixed)

WRK-310

\*\*\*

## Industrial Chemicals #1

acetic acid  
 acetic anhydride  
 aniline  
 benzoic acid †  
 butyl alcohol  
 dioctyl phthalate  
 ethanolamine  
 ethylene glycol  
 furfural  
 furnace oil  
 isopropyl alcohol  
 ethyl alcohol  
 methanol  
 methyl ethyl ketone  
 naphthalene †  
 1-methylnaphthalene  
*o*-cresol †  
*m*-cresol †  
*p*-cresol †  
 phenol †

† @ 2% w/v in *p*-Xylene

WRK-300

\*\*\*

## Industrial Chemicals #2

acetonitrile  
 adipic acid †  
 acrylonitrile  
 chlorobenzene  
 1,2,4-trichlorobenzene ‡  
 butyl acetate  
 hexachlorobenzene ‡  
 benzaldehyde  
 chloroform  
 citric acid †  
 hexachloroethane ‡  
 2-chlorophenol ‡  
 formaldehyde  
 bromoform  
 EDTA §  
 2-nitrophenol †  
 4-nitrophenol †  
 salicylic acid †  
 oxalic acid †

† @ 2% w/v in Ethanol

‡ @ 2% w/v in Chloroform

§ @ 2% w/v in Water

WRK-301

\*\*\*



## Acids and Esters

### ULTRAKits®

#### Kits for Qualitative Measurements

Each ULTRAKit contains 2 mL each of twenty different standards in a convenient plastic box. Solid compounds are dissolved in an appropriate solvent. All standards are packaged in screw-capped vials, and are 98+% pure. These kits are manufactured under ULTRA's ISO 9001 quality system. However, no certificates of analysis are available.

#### Acids #1

acetic acid  
 propanoic acid  
 butanoic acid  
 2-methylpropanoic acid  
 pentanoic acid  
 3-methylbutanoic acid  
 hexanoic acid  
 heptanoic acid  
 octanoic acid  
 nonanoic acid  
 decanoic acid †  
 undecanoic acid †  
 dodecanoic acid †  
 tridecanoic acid †  
 tetradecanoic acid †  
 pentadecanoic acid †  
 hexadecanoic acid †  
 heptadecanoic acid †  
 octadecanoic acid †  
 eicosanoic acid ‡

† @ 10% w/v in Chloroform

‡ @ 1% w/v in Chloroform

WRK-140

\*\*\*

#### Acids #2

##### (Dibasic)

oxalic acid †  
 malonic acid †  
 succinic acid †  
 glutaric acid †  
 adipic acid †  
 pimelic acid †  
 suberic acid †  
 azelaic acid †  
 sebacic acid †  
 maleic acid †  
 fumaric acid †  
 phthalic acid †  
 isophthalic acid †  
 terephthalic acid ‡  
 itaconic acid ‡  
 dodecanedioic acid ‡  
 tetradecanedioic acid ‡  
 hexadecanedioic acid ‡  
 tartaric acid ‡  
 citraconic acid ‡

† @ 2% w/v in DMF

‡ @ 1% w/v in DMF

WRK-141

\*\*\*

#### Acids #3

##### (Aromatic)

benzoic acid  
*o*-toluic acid  
*m*-toluic acid  
*p*-toluic acid  
*o*-chlorobenzoic acid  
*m*-chlorobenzoic acid  
*p*-chlorobenzoic acid  
*o*-nitrobenzoic acid  
*m*-nitrobenzoic acid  
*p*-nitrobenzoic acid  
*o*-hydroxybenzoic acid  
*m*-hydroxybenzoic acid  
*p*-hydroxybenzoic acid  
*o*-methoxybenzoic acid  
*m*-methoxybenzoic acid  
*p*-methoxybenzoic acid  
*o*-aminobenzoic acid  
*m*-aminobenzoic acid  
*p*-aminobenzoic acid  
 3,4,5-trihydroxybenzoic acid

All @ 2% w/v in Methanol

WRK-142

\*\*\*

#### Esters #1

methyl acetate  
 methyl propanoate  
 methyl butanoate  
 methyl pentanoate  
 methyl hexanoate  
 methyl heptanoate  
 methyl octanoate  
 methyl nonanoate †  
 methyl decanoate †  
 methyl dodecanoate †  
 methyl tetradecanoate †  
 methyl hexadecanoate †  
 ethyl acetate  
 ethyl butanoate  
 ethyl hexanoate  
 ethyl octanoate  
 ethyl decanoate †  
 ethyl dodecanoate †  
 propyl acetate  
 propyl butanoate

† @ 2% w/v in Chloroform

WRK-130

\*\*\*

#### Esters #2

methyl nonanoate  
 methyl decanoate  
 methyl undecanoate  
 methyl dodecanoate  
 methyl tridecanoate  
 methyl tetradecanoate  
 methyl pentadecanoate  
 methyl hexadecanoate  
 methyl heptadecanoate  
 methyl octadecanoate  
 ethyl nonanoate  
 ethyl decanoate  
 ethyl undecanoate  
 ethyl dodecanoate  
 ethyl tridecanoate  
 ethyl tetradecanoate  
 ethyl pentadecanoate  
 ethyl hexadecanoate  
 ethyl heptadecanoate  
 ethyl octadecanoate

All @ 2% w/v in Chloroform

WRK-131

\*\*\*

#### Esters #3

##### (Dibasic)

dimethyl oxalate  
 dimethyl malonate  
 dimethyl succinate  
 dimethyl glutarate  
 dimethyl adipate  
 dimethyl pimelate  
 dimethyl suberate  
 dimethyl azelate  
 dimethyl sebacate  
 diethyl oxalate  
 diethyl malonate  
 diethyl succinate  
 diethyl glutarate  
 diethyl adipate  
 diethyl pimelate  
 diethyl suberate  
 diethyl azelate  
 diethyl sebacate  
 diethyl fumarate  
 diethyl maleate

All @ 2% w/v in Chloroform

WRK-132

\*\*\*

## Alcohols, Aldehydes, Ketones, and Ethers

### Aldehydes & Ketones

propanal  
butanal  
2-methylpropanal  
methacrolein  
pentanal  
2-methylbutanal  
hexanal  
heptanal  
octanal  
2-butanone  
2-pentanone  
3-pentanone  
2-hexanone  
cyclohexanone  
4-methyl-2-pentanone  
mesityl oxide  
2-heptanone  
3-heptanone  
2-octanone  
cyclopentanone

WRK-150

\*\*\*

### Aldehydes

formaldehyde  
acetaldehyde  
propanal  
acrolein  
butanal  
methacrolein  
2-methylpropanal  
2-methylbutanal  
pentanal  
hexanal  
2-methylpentanal  
heptanal  
octanal  
nonanal  
decanal  
undecanal †  
dodecanal †  
tridecanal †  
tetradecanal †

† @ 2% w/v in Chloroform

WRK-151

\*\*\*

### Ketones

acetone  
2-butanone  
3-methyl-2-butanone  
2-pentanone  
3-pentanone  
2-hexanone  
3-methyl-2-pentanone  
4-methyl-2-pentanone  
3-hexanone  
2-heptanone  
3-heptanone  
2-methyl-3-hexanone  
5-methyl-2-hexanone  
2-octanone  
2-nonanone  
2-decanone  
2-undecanone  
2-dodecanone  
2-tridecanone

WRK-155

\*\*\*

### Alcohols #1

methanol  
ethanol  
propanol  
isopropanol  
1-butanol  
2-methylpropanol  
sec-butanol  
tert-butanol  
1-pentanol  
2-pentanol  
3-pentanol  
1-hexanol  
3-hexanol  
1-heptanol  
4-heptanol  
1-octanol  
1-decanol  
1-dodecanol †  
1-tetradecanol †  
1-hexadecanol †

† @ 2% w/v in Chloroform

WRK-120

\*\*\*

### Alcohols #2

allyl alcohol  
methallyl alcohol  
1-decanol  
1-undecanol †  
1-dodecanol †  
1-tridecanol †  
1-tetradecanol †  
1-pentadecanol †  
1-hexadecanol †  
cyclopentanol  
cyclohexanol  
2-methylcyclohexanol  
3-methylcyclohexanol  
4-methylcyclohexanol  
2-ethyl-1-butanol  
2-ethyl-1-hexanol  
phenylmethanol  
1-phenylethanol  
2-phenylethanol  
3-phenyl-1-propanol

† @ 2% w/v in Chloroform

WRK-121

\*\*\*

### Polyols & Ethers

1,2-propanediol  
1,3-propanediol  
1,3-butanediol  
2,3-butanediol  
1,4-butanediol  
1,5-pentanediol  
1,6-hexanediol †  
1,7-heptanediol †  
1,8-octanediol †  
1,9-nonanediol †  
1,10-decanediol †  
ethylene glycol  
dipropylene glycol  
glycerol  
diethylene glycol monomethyl ether  
diethylene glycol monoethyl ether  
diethylene glycol monobutyl ether  
ethylene glycol monomethyl ether  
ethylene glycol monoethyl ether  
ethylene glycol monobutyl ether

† @ 2% w/v in Ethanol

WRK-190

\*\*\*

## Chlorinated Hydrocarbons and Mixed Functionality

### ULTRAKits®

#### Kits for Qualitative Measurements

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#### Chlorinated Hydrocarbons #1

1-chlorobutane  
2-chlorobutane  
1-chloropentane  
2-chloropentane  
1-chlorohexane  
1-chloroheptane  
1-chlorooctane  
1-chlorononane  
1-chlorodecane  
1,3-dichloropropane  
1,4-dichlorobutane  
1,5-dichloropentane  
1,2,3-trichloropropane  
chlorobenzene  
*o*-chlorotoluene  
*m*-chlorotoluene  
*p*-chlorotoluene  
*o*-dichlorobenzene  
*m*-dichlorobenzene  
*p*-dichlorobenzene †

† @ 2% w/v in *p*-Xylene

WRK-160

\*\*\*

#### Chlorinated Hydrocarbons #2

chloroform  
carbon tetrachloride  
methylene chloride  
*trans*-1,2-dichloroethylene  
*cis*-1,2-dichloroethylene  
1,2-dichloroethane  
1,1,2-trichloroethane  
1,1,2,2-tetrachloroethane  
1,1,2,2-tetrachloroethylene  
allyl chloride  
chlorobenzene  
*o*-dichlorobenzene  
*p*-dichlorobenzene †  
*m*-dichlorobenzene  
1-chloronaphthalene  
*o*-chlorophenol †  
*m*-chlorophenol †  
*p*-chlorophenol †  
4-chlorostyrene  
2-chloroethanol

† @ 1% w/v in *p*-Xylene

WRK-161

\*\*\*

#### Mixed Functionality #1

##### (C6 and C7)

hexane  
1-hexene  
1-hexanol  
hexanal  
2-hexanone  
hexanoic acid  
methyl hexanoate  
1-chlorohexane  
hexylamine  
benzene  
heptane  
1-heptene  
1-heptanol  
heptanal  
2-heptanone  
heptanoic acid  
methyl heptanoate  
1-chloroheptane  
heptylamine  
toluene

WRK-203

\*\*\*

#### Mixed Functionality #2

##### (C8 and C9)

octane  
1-octene  
1-octanol  
octanal  
2-octanone  
octanoic acid  
methyl octanoate  
1-chlorooctane  
octylamine  
ethylbenzene  
nonane  
1-nonene  
1-nonanol  
nonanal  
2-nonanone  
nonanoic acid  
methyl nonanoate  
1-chlorononane  
nonylamine  
propylbenzene

WRK-204

\*\*\*

#### Mixed Functionality #3

##### (C10 and C11)

decane  
1-decene  
1-decanol  
decanal  
2-decanone  
decanoic acid  
methyl decanoate  
1-chlorodecane  
decylamine  
butylbenzene  
undecane  
1-undecene  
1-undecanol  
undecanal  
2-undecanone  
undecanoic acid  
methyl undecanoate  
1-chloroundecane  
undecylamine  
amylbenzene

WRK-205

\*\*\*

## Phthalates, Phenols, Amines, and Amino Acids

### Phthalate Esters #1

dimethyl isophthalate  
dimethyl phthalate  
diethyl phthalate  
dibutyl phthalate  
diisobutyl phthalate  
diamyl phthalate  
dihexyl phthalate  
diisohexyl phthalate  
dicyclohexyl phthalate  
di-*n*-octyl phthalate  
dioctyl isophthalate  
dinonyl phthalate  
diisononyl phthalate  
didecyl phthalate  
diisodecyl phthalate  
diundecyl phthalate  
didodecyl phthalate  
ditridecyl phthalate  
diphenyl phthalate  
diphenyl isophthalate

All @ 1% w/v in Chloroform

WRK-143

\*\*\*

### Phenols

phenol  
*o*-cresol  
*m*-cresol  
*p*-cresol  
2,3-xyleneol  
2,4-xyleneol  
2,5-xyleneol  
2,6-xyleneol  
3,4-xyleneol  
3,5-xyleneol  
*o*-ethylphenol  
*m*-ethylphenol  
*p*-ethylphenol  
2-isopropylphenol  
2-*n*-propylphenol  
2,3,5-trimethylphenol  
2,4,6-trimethylphenol  
4-*tert*-butylphenol  
1-naphthol  
2-naphthol

All @ 2% w/v in *p*-Xylene

WRK-170

\*\*\*

### Amines

#### (Aliphatic Amines)

*n*-butylamine  
isobutylamine  
*sec*-butylamine  
*tert*-butylamine  
pentylamine  
isopentylamine  
hexylamine  
heptylamine  
octylamine  
nonylamine  
decylamine  
hexadecylamine †  
cyclohexylamine  
diisopropylamine  
dibutylamine  
dipentylamine  
dihexylamine  
dicyclohexylamine  
triethylamine  
tributylamine

† @ 2% w/v in Ethanol

WRK-180

\*\*\*

### Amines

#### (Aromatic Amines)

benzylamine  
piperidine  
aniline  
dibenzylamine  
tribenzylamine †  
N-methylaniline  
N-ethylaniline  
2,4-dimethylaniline  
N,N-dimethylaniline  
N,N-diethylaniline  
*o*-toluidine  
*m*-toluidine  
*p*-toluidine †  
1-naphthylamine †  
*o*-phenylenediamine †  
*m*-phenylenediamine †  
*p*-phenylenediamine †  
2-methylpiperidine  
 $\alpha$ -phenylethylamine  
 $\beta$ -phenylethylamine

† @ 2% w/v in Ethanol

WRK-181

\*\*\*

### Amino Acids

L-alanine  
L-arginine  
creatine  
L-glutamic acid  
glycine  
L-histidine  
hydroxy-L-proline  
L-isoleucine  
L-leucine  
L-lysine  
L-methionine  
L-phenylalanine  
L-proline  
sarcosine  
L-serine  
L-threonine  
L-tryptophan  
L-valine  
L-norleucine

@ 1% w/v in Water

WRK-145

\*\*\*