

## BMF 57 - PAH METABOLITES

The major source of PAHs is incomplete combustion of organic material like coal, oil or wood. Except of breathing in contaminated air from e.g. cigarette smoke or a fire place, eating food is a significant source of PAHs for humans, too. Exposure to PAHs means always a mixture of PAHs - therefore the dynamics of metabolism are important and dependent on composition of the mixture.

Chiron AS offers a broad selection of PAH Nitro-/Amino- and Hydroxy-/Keto- Metabolites as reference materials. Please inquire for more details (solution, neat).

PAH Metabolites		Naphthalenes	
Internal standards		Nitronaphthalenes	
<i>Deuterated nitroPAHs</i>		0007.10	1-Nitronaphthalene
2216.10	1-Nitronaphthalene-d7	0008.10	2-Nitronaphthalene
8243.11	2-Methyl-1-nitronaphthalene-d9	2195.11	1-Methyl-4-nitronaphthalene
1109.13	2-Nitrofluorene-d9	2196.11	1-Methyl-5-nitronaphthalene
8382.14	9-Nitrophenanthrene-d9	2197.11	1-Methyl-6-nitronaphthalene
1107.14	9-Nitroanthracene-d9	2199.11	2-Methyl-1-nitronaphthalene
2217.16	1-Nitropyrene-d9	2198.11	2-Methyl-4-nitronaphthalene
1116.16	3-Nitrofluoranthene-d9	1105.10	1,5-Dinitronaphthalene
8242.18	1-Nitrotriphenylene-d11	1458.10	2,4-Dinitro-1-naphthol
1115.18	6-Nitrochrysene-d11		<i>Aminonaphthalenes</i>
1112.20	6-Nitrobenzo[a]pyrene-d11	1779.10	1-Aminonaphthalene
<i>Deuterated aminoPAHs</i>		1780.10	2-Aminonaphthalene
2215.10	1-Aminonaphthalene-d7	1774.11	1-Amino-2-methylnaphthalene
1542.10	2-Aminonaphthalene-d7	1781.10	1,5-Diaminonaphthalene
1539.12	2-Aminobiphenyl-d9	1782.10	1,8-Diaminonaphthalene
1540.12	4-Aminobiphenyl-d9	1783.10	2,3-Diaminonaphthalene
1541.13	2-Aminofluorene-d11	1759.10	5-Amino-1-naphthol
<b>Biphenyls and terphenyls</b>		1760.10	8-Amino-2-naphthol
<i>Nitrobiphenyls and terphenyl</i>			<b>Acenaphthenes and acenaphthylenes</b>
1485.12	2-Nitrobiphenyl		<i>Nitroacenaphthenes</i>
1340.12	4-Nitrobiphenyl	1113.12	5-Nitroacenaphthene
1208.12	2,2'-Dinitrobiphenyl		<b>Fluorenes</b>
1738.12	4,4'-Dinitrobiphenyl		<i>Nitrofluorenes</i>
1739.12	3,3'-Dinitrobenzidine	1108.13	2-Nitrofluorene
1114.18	4,4"-Dinitro-p-terphenyl	1111.13	2,7-Dinitrofluorene
<i>Aminobiphenyls</i>		3550.13	2-Nitro-9-fluorenone
1804.12	3-Aminobiphenyl		<i>Aminofluorenes</i>
2696.12	2-Aminobiphenyl	1761.13	2-Aminofluorene
2783.12	4-Aminobiphenyl	1764.13	2-Amino-9-fluorenone
1773.12	4,4'-Diaminobiphenyl	1762.13	2,7-Diaminofluorene
1815.12	3,3'-Diaminobenzidine	3553.13	9-Aminofluorene
2785.12	3,3'-Dichlorobenzidine	1763.13	9-Aminofluorene hydrochloride
2786.14	3,3'-Dimethylbenzidine		<b>Phenanthrenes</b>
2761.14	3,3'-Dimethoxybenzidine		<i>Nitro- and Aminophenanthrenes</i>
F-7008	2,3-Diaminobiphenyl 2HCl	2206.14	2-Nitrophenanthrene
F-7009	3,4-Diaminobiphenyl 2HCl	2205.14	3-Nitrophenanthrene
<i>Aminodiphenylmethanes</i>		2204.14	9-Nitrophenanthrene
2762.13	4,4'-Methylenedianiline	0041.18	5-Nitrobenzo[c]phenanthrene
2787.15	3,3'-Dimethyl-4,4'-diaminodiphenylmethane	8241.18	1-Nitrotriphenylene



	<b>Anthracenes</b>		<b>Anthanthrenes</b>
	<i>Nitroanthracenes</i>	0050.22	6-Nitroanthanthrene
1459.14	2-Nitroanthracene		<b>Perylenes</b>
1106.14	9-Nitroanthracene		<i>Nitro- and aminoperylene</i>
1460.15	9-Methyl-10-nitroanthracene	0045.20	1-Nitroperylene
0042.14	9,10-Dinitroanthracene	0046.20	3-Nitroperylene
	<i>Nitrobenzanthracenes</i>	1791.20	1-Aminoperylene
0043.18	7-Nitrobenz[a]anthracene	1792.20	3-Aminoperylene
0044.22	7-Nitrobenz[a,h]anthracene		<b>Coronenes</b>
	<i>Aminoanthracenes</i>		<i>Nitrocoronenes</i>
1784.14	1-Aminoanthracene	0047.24	1-Nitrocoronene
1765.14	2-Aminoanthracene		<i>Other nitro/aminoPAHs</i>
1793.18	7-Aminobenz[a]anthracene	1127.17	3-Nitrobenzanthrone
	<b>Fluoranthrenes</b>	8386.17	3-Aminobenzanthrone
	<i>Nitrofluoranthrenes</i>		
1463.16	1-Nitrofluoranthene		<b>Hydroxy-Keto PAH-metabolites</b>
1278.16	2-Nitrofluoranthene		
0025.16	3-Nitrofluoranthene		<i>Hydroxy- and methoxy F-PAHs®</i>
	<i>Aminofluoranthenes</i>		<i>Internal Standards</i>
1766.16	3-Aminofluoranthene	1923.14	3-Fluoro-6-hydroxyphenanthrene
	<b>Pyrenes</b>	2207.18	1-Fluoro-3-hydroxychrysene
	<i>Nitropyrenes</i>	2227.18	1-Fluoro-4-hydroxychrysene
0009.16	1-Nitropyrene	2208.18	3-Fluoro-2-hydroxychrysene
1468.16	2-Nitropyrene	1947.19	1-Fluoro-3-methoxychrysene
0048.16	4-Nitropyrene	1946.19	3-Fluoro-2-methoxychrysene
0013.16	1,3-Dinitropyrene	1948.19	3-Fluoro-4-methoxychrysene
0014.16	1,6-Dinitropyrene	1945.19	4-Fluoro-1-methoxychrysene
0015.16	1,8-Dinitropyrene	3544.10	6-Fluoro-4-hydroxy-2-methylquinoline
	<i>Nitrobenzo[a]pyrenes</i>		<i>Deuterated hydroxy- and keto-PAHs</i>
1635.20	1-/3-Nitrobenzo[a]pyrene		<i>Internal Standards</i>
0049.20	6-Nitrobenzo[a]pyrene	8479.10	1-Naphthol-d7
	<i>Nitrobenzo[e]pyrenes</i>	8480.10	2-Naphthol-d7
2170.20	1-/3-Nitrobenzo[e]pyrene	1490.16	1-Hydroxypyrene-d9
	<i>Hydroxynitropyrenes</i>	9523.10	1,4-Naphthoquinone-d6
8204.16	6-Hydroxy-1-nitropyrene	9524.14	Anthraquinone-d8
	<i>Aminopyrenes</i>		
1767.16	1-Aminopyrene		
1786.16	2-Aminopyrene		<b>Biphenyls and terphenyls</b>
1787.16	4-Aminopyrene		<i>Hydroxy biphenyls</i>
1768.16	1,3-Diaminopyrene	1600.12	4,4'-Dihydroxybiphenyl
1769.16	1,6-Diaminopyrene		
1770.16	1,8-Diaminopyrene		
1788.20	6-Aminobenzo[a]pyrene		
	<b>Chrysenes</b>		
	<i>Nitrochrysenes</i>		
0017.18	6-Nitrochrysene		
	<i>Amino-chrysenes</i>		
1794.18	2-Amino-chrysene		
1785.18	6-Amino-chrysene		



	<b>Naphthalenes</b>		<b>Phenanthrenes</b>
	<i>Naphthols</i>		<i>Hydroxyphenanthrenes</i>
2376.10	1-Naphthol	0321.14	1-Hydroxyphenanthrene
2377.10	2-Naphthol	0322.14	2-Hydroxyphenanthrene
1597.10	2,3-Dihydroxynaphthalene	0323.14	3-Hydroxyphenanthrene
9697.10	1,4-Dihydroxynaphthalene	0324.14	4-Hydroxyphenanthrene
9705.10	1,2-Dihydroxynaphthalene	0325.14	9-Hydroxyphenanthrene
1924.10	<i>trans</i> -1,2-Dihydroxy-1,2-dihydronaphthalene	1925.10	<i>trans</i> -1,2-Dihydroxy-1,2-dihydro-
3670.11	2-Methyl-1-naphthol		phenanthrene
2808.11	3-Methyl-1-naphthol	1488.14	<i>trans</i> -9,10-Dihydroxy-9,10-dihydro-
2805.11	4-Methyl-1-naphthol		phenanthrene
3071.11	5-Methyl-1-naphthol		<b>Glucuronides</b>
3072.11	6-Methyl-1-naphthol	1487.20	Phenanthryl-9-O-glucuronide
2816.11	7-Methyl-1-naphthol		<b>Methoxyphenanthrenes</b>
2817.11	1-Methyl-2-naphthol	1726.15	1-Methoxyphenanthrene
2815.11	3-Methyl-2-naphthol	3674.15	2-Methoxyphenanthrene
3073.11	4-Methyl-2-naphthol	1728.15	3-Methoxyphenanthrene
3074.11	5-Methyl-2-naphthol	3675.15	4-Methoxyphenanthrene
2755.11	6-Methyl-2-naphthol	1729.15	9-Methoxyphenanthrene
2766.11	7-Methyl-2-naphthol		<b>Ketophenanthrenes</b>
2809.11	8-Methyl-2-naphthol	0055.15	4H-Cyclopenta[def]phenanthren-4-one
1346.10	<i>cis</i> -4-(2-Hydroxyphenyl)-2-oxobut-3-enoic acid (Naphthalene metabolite)	0051.14	Phenanthrene-1,4-dione
	<b>Ketonaphthalenes (naphthoquinones)</b>	0056.18	Benzo[ <i>c</i> ]phenanthrene[1,4]quinone
0010.13	Perinaphthenone	0057.18	Benzo[ <i>c</i> ]phenanthrene[5,6]quinone
3546.11	2-Methyl-1,4-naphthoquinone		<b>Anthracenes</b>
1401.14	$\beta$ -Naphthylpropylketone		<b>Hydroxy- and ketoanthracenes</b>
8107.10	1,4-Naphthoquinone	0016.14	1,4-Anthraquinone
8468.6	Quinone	1178.14	9,10-Anthraquinone
	<b>Acenaphthenes and acenaphthylenes</b>	3560.15	2-Methyl-9,10-anthraquinone
	<b>Hydroxy-, Keto-acenaphthenes</b>	3562.16	2,3-Dimethyl-9,10-anthraquinone
1735.12	1-Acenaphthenol	3561.16	2-Ethyl-9,10-anthraquinone
0006.12	Acenaphthenequinone	3677.14	1-Hydroxy-9,10-anthraquinone
9841.12	1-Acenaphthenone	8015.14	2-Hydroxy-9,10-anthraquinone
	<b>Fluorenes</b>	1679.14	1,3-Dihydroxy-9,10-anthraquinone
	<b>Hydroxy- and ketofluorenes</b>	3557.14	1,4-Dihydroxy-9,10-anthraquinone
1599.13	2-Hydroxyfluorene	3558.14	1,5-Dihydroxy-9,10-anthraquinone
2322.13	9-Fluorenone	3555.14	1,8-Dihydroxy-9,10-anthraquinone
1737.13	9-Hydroxyfluorene	3556.14	2,6-Dihydroxy-9,10-anthraquinone
1734.13	1-Hydroxy-9-fluorenone	3559.14	1,2,4-Trihydroxy-9,10-anthraquinone
1509.13	2-Hydroxy-9-fluorenone	3563.16	Aceanthrenequinone
0052.17	Benzo[ <i>a</i> ]fluoren-11-one	1809.16	1,8-Bis(hydroxymethyl)anthracene
0053.17	Benzo[ <i>b</i> ]fluoren-11-one	3564.18	3,4-Dihydrobenzo[ <i>a</i> ]anthracene-1(2 <i>H</i> )-one
3547.27	Truxenone	1291.18	5,6,8,9-Tetrahydrobenz[ <i>a</i> ]anthracen-11(10 <i>H</i> )-one
		1733.18	1,2-Benz[ <i>a</i> ]anthraquinone



	<b>Pyrenes</b>		<b>PASHs</b>
	<i>Hydroxy-, methoxy-, and ketopyrenes</i>		<i>Hydroxydibenzothiophenes</i>
0021.16	1-Hydroxypyrene	2123.12	2-Hydroxydibenzothiophene
8203.16	2-Hydroxypyrene		<i>Other dibenzothiophenes</i>
3565.20	7,8,9,10-Tetrahydro-benzo[ <i>a</i> ]pyren-7-ol	1753.12	Dibenzothiophene sulfone
1506.17	1-Methoxypyrene	1289.17	gamma-Oxo- $\alpha$ -methyl-2-dibenzothiophene-butyracacid
0063.18	Cyclopenta[ <i>cd</i> ]pyren-3(4 <i>H</i> )-one		
0059.19	6H-Benzo[ <i>cd</i> ]pyren-6-one		<b>PANHs</b>
1293.20	9,10-Dihydrobenzo[ <i>a</i> ]pyren-7(8 <i>H</i> )-one		<b>Quinolines and benzoquinolines</b>
0058.24	Dibenzo[ <i>a,i</i> ]pyrene[5,8]quinone		<i>Hydroxycarbazoles</i>
1596.16	Pyrene-1-sulfonic acid sodium salt	1588.12	2-Hydroxycarbazole
	<b>Glucuronides</b>	1590.12	4-Hydroxycarbazole
1489.22	Pyrenyl-1- <i>O</i> -glucuronide	1587.12	2-Hydroxy-5,6,7,8-tetrahydrocarbazole
	<i>Hydroxynitropyrenes</i>	1589.13	2-Hydroxy-5,6,7,8-tetrahydro-9-
8204.16	6-Hydroxy-1-nitropyrene		methylcarbazole
	<b>Chrysenes</b>	1593.16	4-Hydroxy-11H-indolo[2,3- <i>f</i> ]naphthalene
	<i>Hydroxychrysenes</i>	1591.16	5,6-Dihydro-4-hydroxy-11H-indolo[2,3- <i>f</i> ]-
1492.18	1-Hydroxychrysene		naphthalene
1680.18	2-Hydroxychrysene	1594.16	4-Hydroxy-5,6,6a,11a-tetrahydro-11H-
1493.18	3-Hydroxychrysene		benzo[ <i>a</i> ]carbazole
1736.18	4-Hydroxychrysene	1592.16	8-Bromo-5,6-dihydro-4-hydroxy-11H-
1324.18	Chrysene- <i>trans</i> -1,2-dihydrodiol		indolo[2,3- <i>f</i> ]naphthalene
1325.18	Chrysene- <i>trans</i> -3,4-dihydrodiol		
1326.18	Chrysene- <i>trans</i> -5,6-dihydrodiol		<b>PAOHs</b>
	<i>Methoxychrysenes</i>		<b>Dibenzofurans</b>
1629.19	1-Methoxychrysene		<i>Hydroxydibenzofurans</i>
1709.19	2-Methoxychrysene	1595.12-10MG	2-Hydroxydibenzofuran
1630.19	3-Methoxychrysene		
1710.19	4-Methoxychrysene		
	<i>Ketochrysenes</i>		
0011.18	1,4-Chrysenequinone		
0019.18	5,6-Chrysenequinone		
	<b>Bisanthenes</b>		
2613.28	Bisanthone		
	<b>Acenes and phenes</b>		
3566.18	5,12-Naphthacenequinone		
3567.22	5,7,12,14-Pentacenetetrone		
	<i>Other ketoPAHs</i>		
1684.17	Benzanthrone		
1730.13	9(10 <i>H</i> )-Acridone		
2615.34	Isoviolanthrone		
2614.34	Violanthrone		
9683.14	Anthrone		

