

Kerr McGee Chemical Corp
Navassa, Brunswick County, NC
NCD 980 557 805

REFERENCE 15

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THE SOIL CHEMISTRY OF HAZARDOUS MATERIALS

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Hazardous Materials Control Research Institute
Silver Spring, Maryland

TABLE 9.21 Organic Chemicals Identified as Components of Coal Tar.

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Reference	
133	acenaphthene 1-acenaphthol acenaphthylene acephenanthrene acephenanthrylene acetaldehyde acetic acid
134	acetone acetomitrile acetophenone acridine adipate esters aliphatic esters >C-9 alkanes >C-6 alkyl acenaphthols alkyl acridines alkyl alcohols >C-6
121	1-aminonaphthalene
121	2-aminonaphthalene
135	aminotetralin aminotoluene aniline anisoles
136	anthanthrene anthracene 9,10-anthraquinone aza-acenaphthylene azabenzofluorene
137	1-azacarbazole 1-azafluoranthene 7-azafluoranthene 4-azafluorene 7-azaindole 4-azapyrene azulene
119	benz(e)acephenanthrylene benz(a)acridine benz(c)acridine benzanilide benz(a)anthracene benzathrone benzene benzidine benzindole
119	

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TABLE 9.21 Organic Chemicals Identified as Components of Coal Tar. (cont.)

benzo(a)carbazole
11H-benzo(a)carbazole
benzo(b)carbazole
5H-benzo(b)carbazole
7H-benzo(c)carbazole
4H-benzo(def)carbazole
benzo(b)chrysene
benzo(b)fluoranthene
benzo(ghi)fluoranthene
benzo(j)fluoranthene
benzo(k)fluoranthene
benzo(a)fluorene
11H-benzo(a)fluorene
benzo(b)fluorene
11H-benzo(b)fluorene
benzo(c)fluorene
7H-benzo(c)fluorene
benzofluoreneamine
2,3-benzofuran
7-benzo(b)furanol
benzoic acid
benzo(a)naphthacene
benzo(b)naphtho(2,1-d)furan
benzo(b)naphtho(2,3-d)furan
benzo(b)naphtho(1,2-d)thiophene
benzo(b)naphtho(2,1-d)thiophene
benzo(b)naphtho(2,3-d)thiophene
benzonitrile
benzo(a)pentacene
benzo(rst)pentaphene
benzo(ghi)perylene
benzo(c)phenanthrene
benzo(c)picene
benzo(a)pyrene
benzo(e)pyrene
2,3-benzopyridine
3,4-benzopyridine
benzo(f)quinoline
benzo(h)quinoline
benzo(b)thiophene
benzo(k)xanthene
bicyclohexyl
2,2'-binaphthalene
2,2'-binaphthyl
biphenyl
3-(biphenyl)-4H-4-pyranone
1,2-butadiene

TABLE 9.21 Organic Chemicals Identified as Components of Coal Tar. (cont.)

1,3-butadiene
butane
butanoic acid
2-butanone
1-butene
2-butene
t-butylhydroquinone
3-n-butylphenol
4-n-butylphenol
4-sec-butylphenol
1-butyne
2-butyne

carbon disulfide
carbazole
9H-carbazole
chrysene
coronene
m-cresol
o-cresol
p-cresol
cyano-11H-benzo(b)fluorene
cyanofluorene
1-cyanonaphthalene
2-cyanonaphthalene
2-cyanotoluene
3-cyanotoluene
4-cyanotoluene
4H-cyclopenteno(d,e,f)phenanthrene
1,3-cyclohexadiene
cyclohexane
cyclohexene
cyclopentadiene
cyclopentane
4H-cyclopenta(d,e,f)phenanthrene
cyclopentene

n-decane
dibenz(ac)anthracene
dibenz(ah)anthracene
dibenz(aj)anthracene
dibenzo(b,def)chrysene
13H-dibenzo(a,h)fluorene
dibenzo(b,d)furan

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TABLE 9.21 Organic Chemicals Identified as Components of Coal Tar. (cont.)

TABLE 9

dibenzo(b,d)-2-furanol
 dibenzo(b,d)-3-furanol
 dibenzo(b,d)thiophene
 2,6-di-*t*-butyl-4-methylphenol
 dicyclopentadiene
 1,2-diethylbenzene
 3,5-diethylphenol
 diethylsulfide
 1,2-dihydroacenaphthylene
 9,10-dihydroanthracene
 9,10-dihydroacridine
 2,3-dihydro-1H-benz(e)indene
 2,3-dihydro-1H-idene
 5,12-dihydronaphthacene
 1,4-dihydronaphthalene
 2,3-dihydro-1H-phenalene
 9,10-dihydrophenanthrene
 6,7-dihydro-2-methyl-5H-1-pyridine
 6,7-dihydro-3-methyl-5H-1-pyridine
 6,7-dihydro-5H-1-pyridine
 6,7-dihydro-5H-2-pyridine
 1,2-dihydroxybenzene
 1,3-dihydroxybenzene
 2,2'-dihydroxybiphenyl
 2,4-dihydroxytoluene
 2,6-dihydroxytoluene
 3,4-dihydroxytoluene
 di-isopropylhydroquinone
 2,3-dimethylaniline
 2,4-dimethylaniline
 2,5-dimethylaniline
 2,6-dimethylaniline
 3,4-dimethylaniline
 3,5-dimethylaniline
 2,3-dimethylanthracene
 2,6-dimethylanthracene
 2,7-dimethylanthracene
 9,10-dimethylanthracene
 4,7-dimethylbenzo(b)furan
 5,6-dimethylbenzo(b)furan
 5,7-dimethylbenzo(b)furan
 3,3'-dimethylbiphenyl
 3,4'-dimethylbiphenyl
 3,5-dimethylbiphenyl
 4,4'-dimethylbiphenyl
 2,3-dimethyl-1,3-butadiene
 2,2-dimethyl-3-butyne
 1,3-dimethylcyclohexane

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Coal Tar. (cont.)

TABLE 9.21 Organic Chemicals Identified as Components of Coal Tar. (cont.)

1,4-dimethylcyclohexane
1,1-dimethylcyclopentane
4,6-dimethyldibenzo(b,d)furan
4,6-dimethyldibenzo(b,d)thiophene
2,3-dimethyl-6-ethylpyridine
dimethyl-4-indanol
4,5-dimethylindene
4,6-dimethylindene
4,7-dimethylindene
5,6-dimethylindene
5,7-dimethylindene
6,7-dimethylindene
1,3-dimethylisoquinoline
1,2-dimethylnaphthalene
1,3-dimethylnaphthalene
1,4-dimethylnaphthalene
1,5-dimethylnaphthalene
1,6-dimethylnaphthalene
1,7-dimethylnaphthalene
2,3-dimethylnaphthalene
2,6-dimethylnaphthalene
2,7-dimethylnaphthalene
3,6-dimethylphenanthrene
2,3-dimethylphenol
2,4-dimethylphenol
2,5-dimethylphenol
2,6-dimethylphenol
3,4-dimethylphenol
3,5-dimethylphenol
4,11-dimethylpicene
2,7-dimethylpyrene
2,3-dimethylpyridine
2,4-dimethylpyridine
2,5-dimethylpyridine
2,6-dimethylpyridine
3,4-dimethylpyridine
3,5-dimethylpyridine
2,3-dimethylquinoline
2,4-dimethylquinoline
2,6-dimethylquinoline
2,7-dimethylquinoline
2,8-dimethylquinoline
4,6-dimethylquinoline
4,7-dimethylquinoline
5,8-dimethylquinoline
6,8-dimethylquinoline

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TABLE 9.21 Organic Chemicals Identified as Components of Coal Tar. (cont.)

dimethylsulfide
2,5-dimethylthiophene
3,5-dimethylxanthene
dinaphthofuran
dinaphtho(2,1-b:1',2'-d)thiophene

eicosane
ethanethiol
ethanol
ethylbenzene
ethylene glycol
ethylisocyanide
2-ethylnaphthalene
3-ethylpentane
2-ethylphenol
3-ethylphenol
4-ethylphenol
2-ethylpyridine
3-ethylpyridine
4-ethylpyridine
2-ethyltoluene
3-ethyltoluene
4-ethyltoluene

fluoranthene
fluorene
9H-fluorene
9H-fluorene-2-carbonitrile
2-fluorenol
heptadecane
n-heptane
1-heptene
hexadecane
hexadecanoic acid
hexamethylbiphenyl
n-hexane
1-hexene
1-hexyne
2-hexyne
3-hexyne
hydroxyanthracene
hydroxybenzofluorene
2-hydroxybenzoic acid
3-hydroxybenzoic acid

TABLE 9.22

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TABLE 9.21 Organic Chemicals Identified as Components of Coal Tar. (cont.)

4-hydroxybenzoic acid
 2-hydroxybiphenyl
 9-hydroxy-4-methylfluorene
 5-hydroxy-1-methyl-3-isopropylbenzene
 2-hydroxy-7-methylquinoline
 2-hydroxyphenanthrene
 4-hydroxyphenanthrene
 2-hydroxypropanoic acid
 4-hydroxythionaphthene
 6-hydroxythionaphthene

indan
 indano(2,1-a)indan
 4-indanol
 5-indanol
 indene
 indeno(1,2,3-cd)fluoranthene
 indenole
 indeno(1,2,3-cd)pyrene
 11H-indeno(1,2-b)quinoline
 indole
 6H-indolo(2,3-b)quinoline
 2-isopropylphenol
 3-isopropylphenol
 4-isopropylphenol
 isoquinoline

methanethiol
 4-methoxybenzophenone
 methylacenaphthene
 methylacenaphthylene
 methylacenaphthol
 methylacetylene
 2-methylacridine
 methylaminoacenaphthylene
 2-methylaniline
 3-methylaniline
 4-methylaniline
 1-methylanthracene
 2-methylanthracene
 9-methylanthracene
 methylbenzindole
 1-methylbenzo(a)anthracene
 6-methylbenzo(a)anthracene
 9-methylbenzo(a)anthracene

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TABLE 9.21 Organic Chemicals Identified as Components of Coal Tar. (cont.)

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11-methylbenzo(a)anthracene
methylbenzofluoranthene
methylbenzofluorenamine
2-methylbenzofuran
4-methylbenzo(b)furan
5-methylbenzo(b)furan
6-methylbenzo(b)furan
7-methylbenzo(b)furan
methylbenzo(n)naphtho(2,3-d)furan
3-methylbenzo(f)quinoline
2-methylbenzo(b)thiophene
3-methylbenzo(b)thiophene
2-methylbiphenyl
3-methylbiphenyl
4-methylbiphenyl
2-methyl-1,3-butadiene
2-methyl-2,3-butadiene
2-methyl-3-butyne
N-methylcarbazole
2-methylcarbazole
3-methylcarbazole
1-methylchrysene
6-methylchrysene
methylcyclohexane
methylcyclopentane
methylcyclopenteno(de)cinnoline
2-methyldibenzo(b,d)furan
3-methyldibenzo(b,d)furan
4-methyldibenzo(b,d)furan
2-methyldibenzothiophene
4-methyldibenzothiophene
1,1'-methylenebisbenzene
1-methyl-4-ethylbenzene
3-methyl-3-ethylpentane
2-methyl-3-ethylphenol
2-methyl-4-ethylphenol
2-methyl-5-ethylphenol
3-methyl-4-ethylphenol
3-methyl-5-ethylphenol
3-methyl-6-ethylphenol
4-methyl-2-ethylphenol
4-methyl-3-ethylphenol
1-methyl-1-ethyl-2-phenyl-2-tolyethylene
2-methyl-4-ethylpyridine
1-methylfluorene
2-methylfluorene

(8)

Coal Tar. (cont.)

TABLE 9.21 Organic Chemicals Identified as Components of Coal Tar. (cont.)

3-methylfluorene
4-methylfluorene
9-methylfluorene
2-methyl-9H-carbazole
1-methyl-9H-fluorene
2-methyl-9H-fluorene
9-methyl-9H-fluorene
2-methylheptane
3-methylheptane
3-methylhexane
4-methylindan
1-methyl-5-indanol
3-methyl-4-indanol
3-methyl-5-indanol
4-methyl-5-indanol
5-methyl-4-indanol
6-methyl-4-indanol
6-methyl-5-indanol
7-methyl-4-indanol
7-methyl-5-indanol
4-methylindene
2-methylindole
3-methylindole
4-methylindole
5-methylindole
7-methylindole
methylisocyanide
1-methyl-2-isopropenylbenzene
1-methyl-4-isopropylbenzene
1-methylisoquinoline
3-methylisoquinoline
5-methylisoquinoline
6-methylisoquinoline
7-methylisoquinoline
8-methylisoquinoline
1-methylnaphthalene
2-methylnaphthalene
3-methyl-2-naphthol
3-methylnonane
4-methylnonane
3-methyloctane
2-methylpentane
methylphenanthracene
1-methylphenanthrene
2-methylphenanthrene
3-methylphenanthrene
9-methylphenanthrene
methylphenylnaphthalene

(9)

TABLE 9.21 Organic Chemicals Identified as Components of Coal Tar. (cont.)

TAI

2-methyl-1-phenylpropane
 2-methyl-4-propylphenol
 1-methylpyrene
 2-methylpyrene
 4-methylpyrene
 2-methylpyridine
 3-methylpyridine
 4-methylpyridine
 2-methylquinoline
 3-methylquinoline
 4-methylquinoline
 5-methylquinoline
 6-methylquinoline
 7-methylquinoline
 8-methylquinoline
 2-methyltetrahydrothiophene
 2-methylthionaphthene
 2-methylthiophene
 3-methylthiophene
 methyltriphenylene
 1-methyl-2-vinylbenzene
 1-methyl-4-vinylbenzene

naphthacene
 naphthalene
 naphtho(1,2-b)chrysene
 2',1':1,2-naphthofluorene
 naphtho(1,2-b)furan
 naphtho(2,1-b)furan
 naphthoindole
 1-naphthol
 2-naphthol
 naphtho(1,2-a)pyrene
 naphthopyrrole
 naphtho(1,2-b)thiophene
 naphtho(2,1-b)thiophene
 naphtho(2,3-b)thiophene
 naphtho(2,1,8,7-klmn)xanthene
 o-(2-naphthyl)-phenol
 nonadecane
 nonane

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Tar. (cont.)

TABLE 9.21 Organic Chemicals Identified as Components of Coal Tar. (cont.)

octadecane
 octadecanoic acid
 cis-9-octadecenoic acid
 octahydroanthracene
 n-octane
 5-oxo-4,5-dihydro-4-azapyrene

pentacene
 1,3-pentadiene
 n-pentane
 pentanoic acid
 pentaphene
 1-pentene
 2-pentene
 1-pentyne
 2-pentyne
 perylene
 phenanthrene
 phenanthridine
 5H-phenanthridin-6-one
 phenanthrobenzopyrene
 phenanthro(4,5-bcd)thiophene
 phenol
 1-phenylbenzanthrone
 2-phenylbutane
 1-phenylnaphthalene
 2-phenylnaphthalene
 2-phenylphenanthrene
 1-phenylpropane
 2-phenylpropane
 1-phenyl-1-propanone
 2-phenylpyridine
 4-phenylpyridine
 phthalate esters
 phthalic esters
 phytane
 picene
 pristane
 propadiene
 propanoic acid
 propionamide
 2-n-propylphenol
 3-n-propylphenol
 4-n-propylphenol
 pyrene

(11)