

THE SADTLER STANDARD SPECTRA



BLOCK



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FLUORESCENCE SPECTRA

CREATIVE CHEMISTS SINCE 1874

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JUL 1970 1974 1975 1976 1977 1978 1979 1980 1981



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This collection of spectra contains the excitation and emission spectra, measured on an Aminco-Bowman SPF spectrophotofluorometer, for 500 compounds. The purpose of the publication is to provide the analyst with a reliable source of reference fluorescence spectra for use in identifying and investigating materials.

The Aminco-Bowman SPF single beam instrument (Model 4-8202D) with a 10-280 microphotometer produces uncorrected spectra in the 200 - 800 nm scanning range utilizing a 150 watt xenon excitation source and a 1P21 photomultiplier tube. In each case the spectrum was scanned at the smallest slit width setting consistent with moderate noise levels and high resolution. If the fluorescence characteristics of a given compound were dependent on pH value, its spectra were prepared at the pH which produced maximum fluorescence. During the preparation the fluorescence characteristics were compared with the UV spectra previously published by Sadler to ensure representative spectra.

Methods for preparing calibration curves to enable the published spectra to be "corrected" for comparison with data from other spectrofluorometers are currently being investigated in our laboratories, and comments and suggestions from users of this publication would be appreciated by our staff.

The indexes which accompany this publication are as follows:

the alphabetical index permits the contents to be located by chemical name,

the molecular formula index is arranged in increasing carbon atom number sequence,

the chemical classes index categorizes the compounds according to chemical functionalities present in the molecule,

and the numerical index lists the compounds by their fluorescence spectrum number.

The fluorescence spectrum number appears in the right hand column of each index under the title "FLUOR." and the spectrum numbers in the columns labelled PRISM, GRATING, UV and NMR refer to the spectra for compounds issued in the corresponding publications.

We acknowledge the assistance of Dr. Richard A. Passwater of the American Instrument Company in making this publication possible.

SADTLER STANDARD FLUORESCENCE SPECTRA

ALPHABETICAL INDEX

INTRODUCTION

This index is a listing by chemical name of the compounds contained in the Sadler publication of Standard Fluorescence Spectra.

The compound naming procedure used here is basically that of Chemical Abstracts, thus compounds are indexed primarily by their "parent compound" name with substituent groups and derivatives following the parent name in alphabetical sequence. This system directs the user rapidly to both the actual compound required and other similar compounds available. Cross-reference names which are generally accepted are also included in this index.

In addition to the Fluorescence spectrum numbers, shown in the right hand column of each page; infrared, ultraviolet and NMR spectrum numbers are included in the index to enable the location of spectra in other Sadler publications for further reference.

The use of computerized equipment imposes limitations in symbolism. The alternatives used are as follows:

Deviation from standard punctuation

/	(slash)	--	Read as parenthesis, bracket, or brace
□	(lozenge)	--	Read as indication of superscripting (See last of the examples on the next page)
PR		--	Read as "prime". Therefore 2PR is read as 2'.
*	(asterisk)	--	Also read as "prime".
<		--	Also read as "prime".

Lack of provision for Greek letters, super or subscripts (except as noted above) or lower case letters causes the following changes from normal notation:

A	--	Read as a or α
B	--	Read as b or β
G	--	Read as g or γ
D	--	Read as d or δ
O	--	Read as o, ortho or oxygen
M	--	Read as m or meta
N	--	Read as normal or nitrogen
P	--	Read as p, para or phosphorus
S	--	Read as s (symmetrical) or sulfur
D & L	--	Still retain their original significance when used in conjunction with carbohydrates

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A few examples will help to illustrate the variations to be encountered:

Chemical Abstracts System

s-Triazine,4-amino-6-(p-bromoanilino)-1,2-dihydro-
2,2-dimethyl,

Benz[a]anthracene-7,12-dione

Chryseno[6,5-d]oxazole

Spiro[cyclopropane-1,9'-fluorene],2-acetyl,

Tricyclo[3.3.1.1^{3,7}]decane

ALPHABETICAL INDEX

Sadtler Index

S-TRIAZINE,4-AMINO-6-/P-BROMOANILINO/-1,2-DIHYDRO-
2,2-DIMETHYL-,

BENZ/A/ANTHRACENE-7,12-DIONE

CHRYSENO/6,5-D/OXAZOLE

SPIRO/CYCLOPROPANE-1,9'-FLUORENE/,2-ACETYL-

SPIRO/CYCLOPROPANE-1,9*-FLUORENE/,2-ACETYL-

TRICYCLO/3.3.1.1^{3,7}/DECANE

Note: Non-numeric prefixes to NMR spectra numbers in this index pertain to the following NMR publications:

V Varian spectra Read as δ or τ (ppm)

JEOL 60 MHz spectra Read as δ or τ (ppm)

F JEOL F-19 spectra Read as δ or τ (ppm)

* JEOL 100 MHz spectra Also read as "ppm" (ppm)

Letters cross the following tables from bottom position:
back of provision for Greek letters under or superscripts (except as logic spots) or lower case letters across the following tables from bottom position:

A - Read as α or δ

B - Read as β or δ

C - Read as γ or δ

D - Read as δ or θ

O - Read as σ , α or oxygen

M - Read as μ or water

N - Read as bottom of nitrogen

P - Read as ν , ρ or phosphorus

S - Read as σ (symmetric) or sulfur

D & L -

-

-

**SADTLER FLUORESCENCE SPECTRA
CHEMICAL CLASSES INDEX**

NAME	C	H	Br	Cl	F	I	N	O	P	S	Si	M	FUNCTIONALITY	PRISM	GRATING	U.V.	N.M.R.	FLUOR.	
CARBOXYLIC ACIDS																			
BUTYRIC ACID, 3-METHYL-2-/P-BIPHENYLYL/-,	17	18						2		6	1	3	16279		5057		402		
4-HEXENOIC ACID, 2-/P-BIPHENYLYL/-,	18	18						2		6	1	3	16280	25314	5058		403		
1-NAPHTHALENEACETIC ACID	12	10						2		6	1	3	5874	585	2965	3238	209		
1-NAPHTHALENEACETIC ACID K	12	10						2		6	14	64	10905	585	2965	3238	209		
HIPPURIC ACID, P-AMINO-,	9	10						2	3	6	14	64	3	11186	8202	511	10098	80	
HIPPURIC ACID, P-AMINO-,	9	10						2	3	6	14	64	3	1819	8202	511	10098	80	
ACETIC ACID, /3-CARBAMYL-2-NAPHTHYLOXY/-,	13	11						1	4	6	14	72	3	3	172C8	24588	7277	431	
SALICYLIC ACID, 5-SULFO-,	7	6						6	1	6	22	59	3	3	137	29551	50	16001	9
ACETIC ACID, /3-CYANO-2-NAPHTHYLOXY/-,	13	9						1	3	6	5	72	3	3	17210	24590	5434	432	
1H-BENZ/E/INDENE-1-CARBOXYLIC ACID, 2,3-DIHYDRO-3-OXO-,	14	10						3		6	52	2	3	18278		5801		464	
ACETIC ACID, O-HYDROXYPHENYL-,	8	8						3		6	59	2	3	17420	25680	7333	12840	443	
BENZOIC ACID, 2,5-DIHYDROXY-,	7	6						4		6	59	2	3	7173	8495	2C28	3210	256	
BENZOIC ACID, M-HYDROXY-,	7	6						3		6	59	2	3	3247	368	967	1624	142	
BENZOIC ACID, 2,3,4-TRIHYDROXY-,	7	6						5		6	59	2	3	4577	18063	1265	8668	167	
CINNAMIC ACID, O-HYDROXY-,	9	8						3		6	59	2	3	17173	8719	5419	12878	428	
2,3-CRESOTIC ACID	8	8						3		6	59	2	3	10590	8578	2910	3281	297	
GALLIC ACID, MONOHYDRATE	7	6						5		6	59	2	3	7376	546	2090		259	
GALLIC ACID, MONOHYDRATE	7	6						5		6	59	2	3	7376	546	2090		258	
GENTISIC ACID	7	6						4		6	59	2	3	7173	8495	2028	3210	256	
HYDROCINNAMIC ACID, P-HYDROXY-,	9	10						3		6	59	2	3	9916	28042	2613	14712	288	
HYDROCINNAMIC ACID, P-HYDROXY-,	9	10						3		6	59	2	3	9916	7593	2613	4450	288	
1-NAPHTHOIC ACID, 2-HYDROXY-,	11	8						3		6	59	2	3	234	78	90	13433	15	
1-NAPHTHOIC ACID, 2-HYDROXY-,	11	8						3		6	59	2	3	13209	78	90	13433	15	
2-NAPHTHOIC ACID, 1-HYDROXY-,	11	8						3		6	59	2	3	16455	8715	5154	12735	410	
PENTANOIC ACID, 4,4-BIS/4-HYDROXY-PHENYL/-,	17	18						4		6	59	2	3	14559	24472	4133		354	
PHORETIC ACID	9	10						3		6	59	2	3	9916	7593	2613	4450	288	
PHORETIC ACID	9	10						3		6	59	2	3	9916	28042	2613	14712	288	
PROPIONIC ACID, 3-/P-HYDROXY-PHENYL/-,	9	10						3		6	59	2	3	9916	7593	2613	4450	288	
PROPIONIC ACID, 3-/P-HYDROXY-PHENYL/-,	9	10						3		6	59	2	3	9916	28042	2613	14712	288	
B-RESORCYLIC ACID	7	6						4		6	59	2	3	17377	8722	7324	12834	438	
G-RESORCYLIC ACID	7	6						4		6	59	2	3	10967	8587	2986	540	299	
G-RESORCYLIC ACID	7	6						4		6	59	2	3	10967	8587	7269		299	
SALICYLIC ACID, 6-HYDROXY-,	7	6						4		6	59	2	3	17123	8587		540	299	
SALICYLIC ACID, 3-PHENYL-,	13	10						3		6	59	2	3	9174	15693	2382		282	
SALICYLIC ACID, 5-PHENYL-,	13	10						3		6	59	2	3	9173	15692	2381		281	
SALICYLIC ACID, 5-AMINO-, HYDROCHLORIDE	7	7						1	3	6	59	67	3	3	136C0	8621	3580	18056	323
BENZOIC ACID, 3-METHOXY-4-HYDROXY-,	8	8						4		6	59	72	3	3	1975	8217	546	9C77	105
VANILLIC ACID	8	8						4		6	59	72	3	3	1975	8217	546	9077	105
SALICYLIC ACID, 5-CHLORO-,	7	5						1	3	6	59	83	3	3	3248	18033	968	8773	143
SALICYLIC ACID, 5-CHLORO-, K	7	5						1	3	6	59	83	3	3	11599	18033	968	8773	143
ANTHRANILIC ACID	7	7						1	2	6	64	2	3	27C3	330	729	3159	117	
BENZOIC ACID, M-AMINO-,	7	7						1	2	6	64	2	3	6493	526	18C2	2822	233	
BENZOIC ACID, O-AMINO-,	7	7						1	2	6	64	2	3	2703	330	729	3159	117	
BENZOIC ACID, P-AMINO-,	7	7						1	2	6	64	2	3	1542	15145	15745		91	
BENZOIC ACID, P-AMINO-,	7	7						1	2	6	64	2	3	18164	25867	5766		459	
ISOPHTHALIC ACID, 5-AMINO-,	8	7						1	4	6	64	2	3	13915	471	1486	1216	186	
ANTHRANILIC ACID, 5-CHLORO-,	7	6						1	2	6	64	83	3	3	5426	471	1486	1216	186
ANTHRANILIC ACID, 5-CHLORO-,	7	6						1	2	6	64	83	3	3	5426	471	1486	1216	186
BENZOIC ACID, 2-AMINO-5-CHLORO-,	7	6						1	2	6	64	83	3	3	5426	471	1486	1216	186
BENZOIC ACID, 4-BUTYLAMINO-,	11	15						1	2	6	65	2	3	18726	8879	6034	2C88	494	
3-INDOLEPROPIONIC ACID K	11	11						1	2	6	65	2	5	10719	15557	1489	68C2	188	
BUTYRIC ACID, 4-/3-INDOLYL/-,	12	13						1	2	6	65	73	3	5	5430	28778	1488	17317	187
3-INDOLEBUTYRIC ACID	12	13						1	2	6	65	73	3	5	5430	28778	1488	17317	187
3-INDOLEPROPIONIC ACID	11	11						1	2	6	65	73	3	5	5431	15557	1489	68C2	188
PROPIONIC ACID, 3-/3-INDOLYL/-,	11	11						1	2	6	65	73	3	5	5431	15557	1489	68C2	188
BENZOIC ACID, M-/DIMETHYLAMINO/-,	11	11						1	2	6	66	2	3	13931	8637	39C7	6164	335	
CINCHONINIC ACID, 2-PHENYL-,	16	11						1	2	6	66	2	5	11644	128	166		30	
CINCHONINIC ACID, 2-PHENYL-,	16	11						1	2	6	66	2	5	11644	128	166		30	
CINCHOPHEN	16	11						1	2	6	66	2	5	473	128	166	10C217	30	
CINCHOPHEN	16	11						1	2	6	66	2	5	473	128	166	10C217	30	
4-QUINOLINECARBOXYLIC ACID, 2-PHENYL-,	16	11						1	2	6	66	2	5	11644	128	166	10C217	30	
4-QUINOLINECARBOXYLIC ACID, 2-PHENYL-,	16	11						1	2	6	66	2	5	11644	128	166	10C217	30	
QUININIC ACID	11	9						1	3	6	66	72	3	5	6519	18132	1812		236
QUININIC ACID	11	9						1	3	6	66	72	3	5	6519	18132	1812	1C752	235
4-QUINOLINECARBOXYLIC ACID, 6-METHOXY-,	11	9						1	3	6	66	72	3	5	6519	18132	1812	1C752	235
4-QUINOLINECARBOXYLIC ACID, 6-METHOXY-,	11	9						1	3	6	66	72	3	5	6519	18132	1812	1C752	235

SADLER FLUORESCENCE SPECTRA

CHEMICAL GLASSER INDEX

SADTLER FLUORESCENCE SPECTRA

CHEMICAL CLASSES INDEX

	NAME	C	H	Br	Cl	F	I	N	O	P	S	SI	M	FUNCTIONALITY	PRISM	GRATING	U.V.	N.M.R.	FLUOR.			
12	ESTERS OF CARBOXYLIC ACIDS																					
	ACETIC ACID, 2-NAPHTHYL ESTER	12	10					2					12	1	3	9683	15714	2571	6382	286		
	1-NAPHTHALENEACETIC ACID, METHYL ESTER	13	12					2					12	1	3	2961	357	852	583	130		
	SALICYLIC ACID, P-PHENYLPHENACYL ESTER	21	16					4					12	52	59	3	2885	28990	818	123		
	ACETIC ACID, M-HYDROXYPHENYL ESTER	8	8					3					12	59	2	3	5552	15570	1546	8589	195	
	BENZOIC ACID, P-HYDROXY-, BUTYL ESTER	11	14					3					12	59	2	3	5434	474	972	1214	146	
	BENZOIC ACID, P-HYDROXY-, BUTYL ESTER	11	14					3					12	59	2	3	3252	474	972	1214	146	
	BENZOIC ACID, P-HYDROXY-, BUTYL ESTER	11	14					3					12	59	2	3	3252	372	972	1214	146	
	BENZOIC ACID, P-HYDROXY-, BUTYL ESTER	11	14					3					12	59	2	3	3250	370	970	1192	145	
	BENZOIC ACID, P-HYDROXY-, ETHYL ESTER	9	10					3					12	59	2	3	3249	369	969	1191	144	
	BENZOIC ACID, P-HYDROXY-, METHYL ESTER	8	8					3					12	59	2	3	18045	369	969	1191	144	
	BENZOIC ACID, P-HYDROXY-, METHYL ESTER	8	8					3					12	59	2	3	18045	5713	4002	447		
	BENZOIC ACID, P-HYDROXY-, METHYL ESTER, SODIUM DERIVATIVE	8	7					3					NA	12	59	2	3	18044	5713	4002	447	
	MENTHOL, SALICYLATE	17	24					3					12	59	2	3	1008	204	306	9725	59	
	RESORCINOL, ACETATE	8	8					3					12	59	2	3	5552	15570	1546	8589	195	
	SALICYLIC ACID, BENZYL ESTER	14	12					3					12	59	2	3	1523	256	433	719	89	
	SALICYLIC ACID, BENZYL ESTER	14	12					3					12	59	2	3	1523	256	433	90		
	SALICYLIC ACID, ETHYL ESTER	9	10					3					12	59	2	3	3870	396	1174	196	160	
	SALICYLIC ACID, ISOBUTYL ESTER	11	14					3					12	59	2	3	1007	203	305	724	58	
	SALICYLIC ACID, ISOPENTYL ESTER	12	16					2					12	59	2	3	1522	255	432	1189	88	
	SALICYLIC ACID, P-METH-3-YL ESTER	17	24					3					12	59	2	3	1008	204	306	9725	59	
	SALICYLIC ACID, PHENYL ESTER	13	10					3					12	59	2	3	2931	353	841	178	129	
	SALOL	13	10					3					12	59	2	3	2931	353	841	178	129	
	ANESTHESINE	9	11					1	2				12	64	2	3	3059	8286	888	1856	137	
	ANTHRANILIC ACID, ISOBUTYL ESTER	11	15					1	2				12	64	2	3	949	193	295	10191	55	
	BENZOCAINE	9	11					1	2				12	64	2	3	3059	8286	888	1856	137	
	BENZOIC ACID, P-AMINO-, BENZYL ESTER	14	13					1	2				12	64	2	3	18401	10138	5861	4051	475	
	BENZOIC ACID, P-AMINO-, BUTYL ESTER	11	15					1	2				12	64	2	3	5154	28732	1402	243	179	
	BENZOIC ACID, P-AMINO-, ETHYL ESTER	9	11					1	2				12	64	2	3	3059	8286	888	1856	137	
	BENZOIC ACID, P-AMINO-, ISOBUTYL ESTER	11	15					1	2				12	64	2	3	5155	8375	1403	3179	180	
	ESTER																					
	BENZOIC ACID, P-AMINO-, METHYL ESTER	8	9					1	2				12	64	2	3	5433	473	1490	585	189	
	5-PYRIMIDINECARBOXYLIC ACID, 4-AMINO-2-TRIFLUOROMETHYL-, ETHYL ESTER	8	8			3		3	2				12	64	66	4	5	15259	25132	4541	370	
	ACETIC ACID, 4-ALLYL-2-METHOXY-phenyl ESTER	12	14					3					12	72	2	3	5257	8384	1447	3183	182	
	ACETIC ACID, P-METHOXYBENZYL ESTER	10	12					3					12	72	2	3	2187	8240	581	1205	106	
	ACETIC ACID, 2-PHENOXYETHYL ESTER	10	12					3					12	72	2	3	5256	15522	1446	6791	181	
	P-ANISIC ACID, METHYL ESTER	9	10					3					12	72	2	3	1936	288	533	124	104	
	ANISYL ALCOHOL, ACETATE	10	12					3					12	72	2	3	2187	8240	581	1205	106	
	BENZOIC ACID, 2,3-DIMETHOXY-, METHYL ESTER	10	12					4					12	72	2	3	2856	15384	797	11243	121	
	BENZOIC ACID, 2,3-DIMETHOXY-, METHYL ESTER	10	12					4					12	72	2	3	2856	15384	797		122	
	BENZOIC ACID, 4,4PR-OXYDI-, DIMETHYL ESTER	16	14					5					12	72	2	3	4813		1343		175	
	CARBONIC ACID, DIESTER WITH O-METHOXYPHENOL	15	14					5					12	72	2	3	8677	15666	2258	6868	276	
	EUGENOL, ACETATE	12	14					3					12	72	2	3	5257	8384	1447	3183	182	
	PHENOL, 4-ALLYL-2-METHOXY-, ACETATE	12	14					3					12	72	2	3	5257	8384	1447	3183	182	
	PHENOL, O-METHOXY-, CARBONATE	15	14					5					12	72	2	3	8677	15666	2258	6868	276	
	O-VERATRIC ACID, METHYL ESTER	10	12					4					12	72	2	3	2856	15384	797	11243	122	
	O-VERATRIC ACID, METHYL ESTER	10	12					4					12	72	2	3	2856	15384	797	11243	121	
	NAME	C	H	Br	Cl	F	I	N	O	P	S	SI	M	FUNCTIONALITY	PRISM	GRATING	U.V.	N.M.R.	FLUOR.			

SADTLER FLUORESCENCE SPECTRA
CHEMICAL CLASSES INDEX

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CHEMICAL CLASSES INDEX

NAME		C	H	Br	Cl	F	I	N	O	P	S	SI	M	FUNCTIONALITY	PRISM	GRATING	U.V.	N.M.R.	FLUOR.
20 LACTONES AND LACTIDES OF CARBOXYLIC ACIDS																			
COUMARIN, 4,8-DIMETHYL-7-HYDROXY-, COUMARIN, 7-ALLYLOXY-4-METHYL-, HERNIARIN, 4-METHYL-,		5	11 10 13 12 11 10					3		20	59 72 72	2 5	18750 3148 3161	8889 15427 15437	6045 919 930	13644 10531 6636	498 139 140		
22 SULFUR ACIDS																			
2-NAPHTHALENE SULFONIC ACID 1,5-AMINO ACID BENZENESULFONIC ACID, M-AMINO-, LAURENTS ACID METANILIC ACID 1,5-NAPHTHALENEDISULFONIC ACID, 2-AMINO-, 1-NAPHTHALESULFONIC ACID, 2-AMINO-, 1-NAPHTHALESULFONIC ACID, 5-AMINO-, 1-NAPHTHYLAMINE-5-SULFONIC ACID M-TOLUENESULFONIC ACID, 4-AMINO-, BENZENESULFONIC ACID, O-/P-AMINO- ANILINO/-, DIPHENYLAMINE-2-SULFONIC ACID, 4*- AMINO-, 2-DIBENZOFURANSULFONIC ACID		10 8 10 9 6 7 10 9 6 7 10 9 10 9 10 9 10 9 12 12 12 12 12 8					1	3 1 3 1 3 1 3 1 3 1 1 6 1 3 1 1 3 1 1 3 1 2 3 1 2 3 1 4 1	22 22 22 22 22 22 22 22 22 22 22 22	64 64 64 64 64 64 64 64 64 64 64 72	1 3 2 5	6333 8459 17193 8459 17193 18697 17196 8459 8459 16030 18119 7073	29224 24479 24479 24479 24479 10039 33496 2244 2244 10039 18492	1742 5427 5427 5427 5427 4942 7273 2244 2244 4942 2004	10947 273 429 273 429 491 5139 430 273 273 4420 449	220 273 429 273 429 491 430 273 273 4420 449			
23 SALTS OF SULFUR ACIDS																			
2-FLUORENESULFONIC ACID, POTASSIUM SALT 1,3-BENZENEDISULFONIC ACID, 4,5- DIHYDROXY-, DISODIUM SALT 1,3-BENZENEDISULFONIC ACID, 4,5- DIHYDROXY-, DISODIUM SALT SULFANILIC ACID, SODIUM SALT		13 9 6 4 6 4 6 6					3	1	K	23		1 3	6730 14899 14899 10260	28833 8696 8696 18244	1879 4317 4317 2774	242 3262 4413 293			

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ROUTE	CLASS	NAME	C	H	B	P	I	R	O	P	S	B	M	FUNCTIONALITY	PRISM	GRATING	U.V.	N.M.R.	FLUOR.
26	AMIDES AND IMIDES OF SULFUR ACIDS																		
SDA	METHANESULFONAMIDE, N-2-FLUORENYL-,	15	14	13				1	2	1			26	104711 3	6731	21106	1880	102	243
FCI	BENZENESULFONAMIDE, P-AMINO-,	15	6	8				2	2	1			26	64, 102, 23	301	102	117	9685	25
SPI	DESEPTYL	15	6	8				2	2	1			26	64	23	301	102	117	9685
	PRONTOSIL ALBUM	15	6	8				2	2	1			26	64	23	301	102	117	9685
	PRONTYLIN	15	6	8				2	2	1			26	64	23	301	102	117	9685
	SULFANILAMIDE	15	6	8				2	2	1			26	64	23	301	102	117	9685
29	ORGANIC ESTERS AND SALTS OF INORGANIC SULFUR ACIDS	15																	
DSV	TSAR, PYRANOSIDE, S-	15																	
PSV	PHENOL, 4-AMINO-, HYDROGEN SULFATE, POTASSIUM SALT, HYDRATE	15	6	6				1	4	1	K	29	64	23	3698	15463	1131	7247	157
PSA	TSAR, PYRANOSIDE, S-	15																	
DEA	TSAR, PYRANOSIDE, S-	15																	
ETS	TSAR, PYRANOSIDE, S-	15																	
ETS	TSAR, PYRANOSIDE, S-	15																	
OSA	TSAR, PYRANOSIDE, S-	15																	
PSA	TSAR, PYRANOSIDE, S-	15																	
PSA	TSAR, PYRANOSIDE, S-	15																	
PSA	TSAR, PYRANOSIDE, S-	15																	
PSA	TSAR, PYRANOSIDE, S-	15																	
PSA	TSAR, PYRANOSIDE, S-	15																	
30	PHOSPHORUS ACIDS	15																	
	PHOSPHINIC ACID, /M-AMINOPHENYL/-PHENYL-,	15	12	12				1	2	1			30	64	23	2610	15365	691	114
	PHOSPHINIC ACID, BIS-/M-AMINO-PHENYL/-,	15	12	13				2	2	1			30	64	23	2612	29158	692	115
38	ALL CARBON SUBSTITUTED ACIDS NOT PREVIOUSLY CLASSIFIED	15																	
PSA	M-ARSANILIC ACID, 4-HYDROXY-,	15	6	8				1	4		AS	38	59	64	33	18414	7600	477	

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46	ALDEHYDES																		
108	1-NAPHTHALDEHYDE	11	8											46	1	3	8444	21818	2239
108	1-NAPHTHALECARBOXALDEHYDE	11	8											46	1	3	8444	21818	2239
108	ISOPHTHALALDEHYDE, 5-ETHOXY-4-	10	10											46	59	72	3	6301	18120
108	HYDROXY-,																		1735
108	BENZALDEHYDE, 3,4-DIMETHOXY-,	9	10											46	72	2	3	3887	8313
108	BENZALDEHYDE, 3,4-DIMETHOXY-,	9	10											46	72	2	3	3887	8313
108	BENZALDEHYDE, 3,4-METHYLENEDIOXY-,	8	6											46	72	2	3	3885	15466
108	BENZALDEHYDE, 3,4-METHYLENEDIOXY-,	8	6											46	72	2	3	3885	15466
108	HELIOTROPIN	8	6											46	72	2	3	3885	15466
108	HELIOTROPIN	8	6											46	72	2	3	3885	15466
108	VERATRALDEHYDE	9	10											46	72	2	3	3887	8313
108	VERATRALDEHYDE	9	10											46	72	2	3	3887	8313
108	BENZALDEHYDE, 2-METHOXY-3,4-	9	8											46	72	2	5	2626	15232
108	/METHYLENEDIOXY/-,																		702
108	PIPERONAL	8	6											46	72	2	5	3885	15466
108	PIPERONAL	8	6											46	72	2	5	3885	15466
108	PIPERONAL, 2-METHOXY-,	9	8											46	72	2	5	2626	15232
108																		702	
108																		6001	
108																		116	
47	ALDEHYDE DERIVATIVES																		
108	SALICYLALDEHYDE, AZINE	14	12											47	59	2	3	5705	15579
108																		1586	
108																		198	
50	NITRILES AND ISONITRILES																		
108	BENZONITRILE	7	5											50	1	3	2255	312	602
108	BENZONITRILE, 4,4PR-ETHYLEDI-,	16	12											50	1	3	4789	29052	1324
108	A,A-BI-P-TOLUNITRILE	16	12											50	1	3	4789	29052	1324
108	TEREPHTHALONITRILE, 2,5-DIMETHYL-,	10	8											50	1	3	16387	25355	5124
108	TEREPHTHALONITRILE, 2,6-DIMETHYL-,	10	8											50	1	3	16395	32554	7076
108	M-TOLUNITRILE	8	7											50	1	3	2886	8268	819
108	O-TOLUNITRILE	8	7											50	1	3	2898	8271	829
108	P-TOLUNITRILE	8	7											50	1	3	2887	8269	820
108	ACETONITRILE, 2-/P-AMINOPHENYL/-,	8	8											50	64	2	3	18156	18365
108	5-PYRIMIDINECARBONITRILE, 4-AMINO-	6	6											50	64	66	3	5	18138
108	2-METHYL-,													50	64	66	4	5811	5749
108	5-PYRIMIDINECARBONITRILE, 4-AMINO-	6	3											50	64	66	4	5	15261
108	2-TRIFLUOROMETHYL-,													50	64	66	4	25133	4543
108	PROPIONITRILE, 3-/O-CHLORANILINO/-,	9	9	1										50	65	83	3	6458	15606
108	ACETONITRILE, 3,4-DIMETHOXYPHENYL-,	10	11											50	72	2	3	431	24514
108	ACETONITRILE, /M-METHOXYPHENYL/-,	9	9											50	72	2	3	861	262
108	ACETONITRILE, P-METHOXYPHENYL-,	9	9											50	72	2	3	18504	33900
108	P-ANISONITRILE	8	7											50	72	2	3	14300	24443
108	HOMOVERATRONITRILE	10	11											50	72	2	3	431	24514
108	P-TOLUNITRILE, A,APP-OXYDI-,	16	12											50	72	2	3	4814	28337
108	BENZONITRILE, P-CHLORO-,	7	4	1										50	83	2	3	2893	349
108	BENZONITRILE, P-CHLORO-,	7	4	1										50	83	2	3	2893	349
50																		826	
50																		V 483	
50																		127	

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59 PHENOLS AND THEIR METAL SALTS													270-320	JASCO	IR-ATR	OMA	ZJHOUQIA YAMADA	62
ANTHRATRIOL, 1,2,10-,																		
BENZENE, O-DIHYDROXY-,	6	6					2	59			1	3	18451	25927	5899	34-6	480	
BENZENE, O-DIHYDROXY-,	6	6					2	59			1	3	268	29687	108	17034	21	
BENZENE, O-DIHYDROXY-,	6	6					2	59			1	3	268	29687	108	V 124	21	
BENZENE, P-DIHYDROXY-,	6	6					2	59			1	3	153	47	60	10350	10	
BENZENE, P-DIHYDROXY-,	6	6					2	59			1	3	13206	47	60	10350	10	
P-BENZENEDIOL	6	6					2	59			1	3	13206	47	60	10350	10	
P-BENZENEDIOL	6	6					2	59			1	3	153	47	60	10350	10	
BENZENETRIOL, 1,2,3-,							3	59			1	3	8766	8542	2278	3225	.278	
BIPHENOL, O,O*-,	12	10					3	59			1	3	1154	15118	343	6529	70	
BIPHENOL, P,P*-, 2,2*-DI-TERT-	22	30					2	59			1	3	13941	15765	3812	7945	337	
BUTYL-6,6*-DIMETHYL-,																		
BIPHENYLDIOL, 2,2*-,							2	59			1	3	1154	15118	343	6529	70	
BISPHENOL A	15	16					2	59			1	3	1070	216	325	18669	64	
CARBOLIC ACID	6	6					1	59			1	3	843	165	258	3152	47	
CARVACROL	10	14					1	59			1	3	2470	325	653	684	113	
M-CRESOL, 6-TERT-BUTYL-,	11	16					1	59			1	3	257	89	103	525	18	
M-CRESOL, 4,5-DIAMYL-,	17	28					1	59			1	3	1230	367			77	
M-CRESOL, 4,6-DI-TERT-BUTYL-,	15	24					1	59			1	3	262	4896	106	10197	20	
M-CRESOL, 5-ETHYL-,	9	12					1	59			1	3	8805	8128	2282	3226	68	
M-CRESOL, 5-ETHYL-,	9	12					1	59			1	3	1147	8128	2282	3226	68	
M-CRESOL, 6-ISOPROPYL-,	10	14					1	59			1	3	1916	286	531	V 270	103	
M-CRESOL, 6-ISOPROPYL-,	10	14					1	59			1	3	1916	286	531	14605	103	
O-CRESOL, 6-ALLYL-,	10	12					1	59			1	3	18129	32462	5744	18405	452	
O-CRESOL, 4,4*-BIS/6-TERT-BUTYL-,	22	30					2	59			1	3	13941	15765	3812	7945	337	
O-CRESOL, 4-TERT-BUTYL-,	11	16					1	59			1	3	1061	8118	322	527	63	
O-CRESOL, 6-TERT-BUTYL-,	11	16					1	59			1	3	1234	8131	370	673	79	
O-CRESOL, 5,5PR-ETHYNYLENEDI-,	16	14					2	59			1	3	15022	25085	4400		365	
P-CRESOL	7	8					1	59			1	3	33	8005	15	9491	3	
P-CRESOL, 2-ALLYL-,	10	12					1	59			1	3	18143	8815	5754	13082	455	
P-CRESOL, 2,6-DI-TERT-BUTYL-,	15	24					1	59			1	3	540	18002	9777	526	38	
P-CRESOL, 2,6-DI-TERT-BUTYL-,	15	24					1	59			1	3	283	18002	9777	526	22	
P-CRESOL, 2-/A-METHYLBENZYL/-,	15	16					1	59			1	3	1231	15121	368	6616	78	
P-CRESOL, 2-/1,1,3,3-TETRAMETHYL-BUTYL/-,	15	24					1	59			1	3	545	15057	191	6460	39	
P-CUMENOL	9	12					1	59			1	3	1073	15303	326	6685	65	
2-P-CYENOL	10	14					1	59			1	3	2470	325	653	684	113	
3-P-CYENOL	10	14					1	59			1	3	1916	286	531	14605	103	
3-P-CYENOL	10	14					1	59			1	3	1916	286	531	V 270	103	
DURENOL	10	14					1	59			1	3	486	15165	172	6015	31	
HEMIMELLITENOL	9	12					1	59			1	3	296		116	6013	24	
HYDROQUINOL	6	6					2	59			1	3	153	47	60	10350	10	
HYDROQUINOL	6	6					2	59			1	3	13206	47	60	10350	10	
HYDROQUINONE	6	6					2	59			1	3	13206	47	60	10350	10	
HYDROQUINONE	16	26					2	59			1	3	3230	15442	957	6922	141	
HYDROQUINONE, METHYL-,	7	8					2	59			1	3	707	18044	232	9249	40	
ISOPSEUDOCUMENOL	9	12					1	59			1	3	1382	18410	406	8659	86	
MESITOL	9	12					1	59			1	3	295	8029	115	8657	23	
1,3-NAPHTHALENE DIOL	10	8					2	59			1	3	6360	519	1752		224	
1,3-NAPHTHALENE DIOL	10	8					2	59			1	3	6360	519	1752	6835	223	
1,6-NAPHTHALENE DIOL	10	8					2	59			1	3	994	15293	301	6943	57	
2,3-NAPHTHALENE DIOL	10	8					2	59			1	3	6759	8486	1889	3207	244	
1-NAPHTHOL	10	8					1	59			1	3	7204	8004	2045	5	2	
1-NAPHTHOL	10	8					1	59			1	3	30	8004	2045	5	2	
2-NAPHTHOL	10	8					1	59			1	3	18	8001	2551	3230	1	
2-NAPHTHOL K	10	8					1	59			1	3	9639	8001	2551	3230	1	
PHENOL	6	6					1	59			1	3	843	165	258	3152	47	
PHENOL, 2-ALLYL-3,5,6-TRIMETHYL-,	12	16					1	59			1	3	18359	24679	5848		470	
PHENOL, 2,4-BIS/1-METHYLBUTYL/-,	16	26					1	59			1	3	984	198	299		56	
PHENOL, M-BUTYL-,	10	14					1	59			1	3	16264	25310	5046	12311	401	
PHENOL, P-TERT-BUTYL-,	10	14					1	59			1	3	522	133	179	47	34	
PHENOL, P-TERT-BUTYL-,	10	14					1	59			1	3	8111	133	179	47	34	
PHENOL, P-TERT-BUTYL-,	10	14					1	59			1	3	8111	133	179	J 132	34	
PHENOL, 2-TERT-BUTYL-6-ISOPROPYL-,	13	20					1	59			1	3	1016	15105	310	6615	61	
PHENOL, O-CYCLOHEXYL-,	12	16					1	59			1	3	17169	21389	5417	8595	427	
PHENOL, 4,4PR-CYCLOPENTYLIDENEDI-,	17	18					2	59			1	3	18433	25923	5885		478	
PHENOL, 2,2PP-DI-,	12	10					2	59			1	3	1154	15118	343	6529	70	
PHENOL, 2,6-DIISOPROPYL-,	12	18					1	59			1	3	11625	18580	3227	6439	308	
PHENOL, 2,6-DIISOPROPYL-,	12	18					1	59			1	3	11625	18580	3227		309	
PHENOL, 3,5-DIMETHYL-,	8	10					1	59			1	3	8080	15646	349	83	73	
PHENOL, 3,5-DIMETHYL-,	8	10					1	59			1	3	1183	15646	349	83	73	
PHENOL, P-ISOPROPYL-,	9	12					1	59			1	3	1073	15303	326	6685	65	
PHENOL, 4,4PP-ISOPROPYLIDENEDI-,	15	16					2	59			1	3	1070	216	325	18669	64	
PHENOL, P-1-METHYLBUTYL-,	11	16					1	59			1	3	6554	32045	1819		237	
PHENOL, M-PHENYL-,	12	10					1	59			1	3	5832	28813	1629	262	205	
PHENOL, O-PHENYL-, K	12	10					1	59			1	3	1192	15309	341	6528	67	
PHENOL, O-PHENYL-, S	12	10					1	59			1	3	1146	15309	341	6528	67	
PHENOL, 2,3,5,6-TETRAMETHYL-,	10	14					1	59			1	3	486	15165	172	6015	31	

