TABLE V. ORGANIC DERIVATIVES OF HALIDES
C) Aryl halides 1. Fluorides (Listed in order of increasing atmospheric b.p.)*

No	Name	Boiling point, °C	Melting point °C	n_D^{20}	D_4^{20}	Nitro derivative		Sulfonamide		Miscellaneous
						M P	Position of nitro groups	M P	Position of sulfonamide group	
1	**1,3-Difluorobenzene**	82		1 4404[18]	1 1473$_4^{25}$	74	1 3			
2	**Fluorobenzene**	87		1 466	1 024			125	4	
3	**1,4-Difluorobenzene**	88		1 4423[18]	1 1632$_4^{25}$					Boiling with NaOH → 4-fluorophenol, 48, b p 186–8, n_D^{56} 1 5010, D^{56} 1 1889
4	**1,2-Difluorobenzene**	92	−34	1 4451[18]	1 1496$_4^{25}$					
5	**2-Fluorotoluene**	114						105	5	Oxid → 2-fluorobenzoic acid, 127
6	**3-Fluorotoluene**	116						174	6	Oxid → 3-fluorobenzoic acid, 124
7	**4-Fluorotoluene**	117		1 496	0 998			141	2	Oxid → 4-fluorobenzoic acid, 182
8	**1-Fluoronaphthalene**	214		1 594	1 134					Picrate, 113
9	**2-Fluoronaphthalene**		60							Picrate, 101

*Derivative data given in order m p , crystal color, solvent from which crystallized

TABLE V. ORGANIC DERIVATIVES OF HALIDES

C) Aryl halides 2. Chlorides a) Liquids (Listed in order of increasing atmospheric b.p.)*

No	Name	Boiling point, °C	Melting point, °C	n_D^{20}	D_4^{20}	Nitro derivative		Sulfonamide		Miscellaneous
						M P	Position of nitro groups	M P	Position of sulfonamide group	
1	**Chlorobenzene**	132		1 525	1 107	52	2,4	144	4	2,4-Dinitrobenzenesulfenyl chloride adduct, 123 4
2	**2-Chlorotoluene**	159		1 524	1 082	63	3,5	128	5	Oxid → 2-chlorobenzoic acid, 141
3	**3-Chlorotoluene**	162		1 521	1 072	91	4,6	185	6	Oxid → 3-chlorobenzoic acid, 158
4	**4-Chlorotoluene**	162	7	1 521	1 071	38	2	143	2	Oxid → 4-chlorobenzoic acid, 240
5	**1,3-Dichlorobenzene**	173		1 546	1 288	103	4,6	182	6	
6	**1-Chloro-2-ethylbenzene**	178, 180		1 5218	1 057					Oxid → 2-chlorobenzoic acid, 141
7	**1,2-Dichlorobenzene**	179		1 552	1 305	110	4,5	135, 140	4	
8	**1-Chloro-3-ethylbenzene**	184		1 5199	1 053					Oxid → 3-chlorobenzoic acid, 158
9	**1-Chloro-4-ethylbenzene**	184, 180–1		1 5175	1 045					Oxid → 4-chlorobenzoic acid, 240
10	**2-Chloro-1,4-dimethylbenzene**	184–5	2		$1\ 059_{20}^{20}$	77, 101	5, 5,6	155	5	Sulfonyl chloride, 50
11	**1-Chloro-2-vinylbenzene** (*o*-Chlorostyrene)	189		1 5649	1 100					Polymerizes on heating with benzoyl peroxide
12	**1-Chloro-2,3-dimethylbenzene**	190								Oxid → 3-chloro-2-methylbenzoic acid, 159
13	**1-Chloro-2-isopropylbenzene**	191		1 5168	1 0341					Oxid → 2-chlorobenzoic acid, 141
14	**1-Chloro-2,4-dimethylbenzene**	192, 187		$1\ 5230^{25}$	$1\ 0598_{20}^{20}$	42	6	195	6	Oxid $\xrightarrow{CrO_3/H_2SO_4}$ 4-chloro-3-methylbenzoic acid, 209 10, Oxid $\xrightarrow{\text{aq } KMnO_4}$ 4-chloroisophthalic acid, 294 5
15	**1-Chloro-4-vinylbenzene** (*p*-Chlorostyrene)	192		1 5660	1 0868					Polymerizes on heating with peroxide
16	**1-Chloro-3,4-dimethylbenzene**	194–5	−6		$1\ 069_{15}^{15}$	63	5	207	5	$Cl_2 \xrightarrow{Fe}$ 1,2-dichloro-4 5-dimethylbenzene, 76
17	**1-Chloro-4-isopropylbenzene** (*p*-Chlorocumene)	198		1 5117	1 0208			91		Oxid → 4-chlorobenzoic acid, 240
18	**2,6-Dichlorotoluene**	199		1 5510	1 2686	50, 121	3, 3,5			Chlorosulfonic acid in chl → 3-sulfonyl chloride 54 6, 60 Oxid → 2,6-dichlorobenzoic acid 139
19	**2,5-Dichlorotoluene**	199	4–5		$1\ 2535_{20}^{20}$	50 1, 100–1	4, 4,6			Oxid $\xrightarrow{\text{dil } HNO_3}$ 2,5-dichlorobenzoic acid, 154
20	**2,4-Dichlorotoluene**	200		1 549	1 249	104	3,5			Oxid → 2,4-dichlorobenzoic acid, 164
21	**3,5-Dichlorotoluene**	201				61 2, 99–100	2, 2,6	168 9	2	Oxid → 3,5-dichlorobenzoic acid, 188
22	**2-Chloro-1,3,5-trimethylbenzene**	204–6		$1\ 5212^{30}$	$1\ 0337^{30}$	178	4,6	165–6		Oxid $\xrightarrow{\text{aq } KMnO_4}$ 2-chlorobenzene tricarboxylic acid, 285 (anh), 278 (hyd)
23	**2,3-Dichlorotoluene**	207		1 5511		51, 71–2	4, 4,6			Oxid $\xrightarrow{\text{alk } KMnO_4}$ 2,3-dichlorobenzoic acid, 163
24	**3,4-Dichlorotoluene**	209		1 5471	1 2526	63, 91–2	6, 2,6			Oxid → 3,4-dichlorobenzoic acid, 206
25	**1,2,4-Trichlorobenzene**	213	17			56, 103	5, 3,5	>200		Sulfonyl chloride, 31–4
26	**2-Chloro-4-isopropyl-1-methylbenzene** (2-Chloro-*p*-cymene)	217		$1\ 5178^{17}$	$1\ 015_4^{17}$	109–10	5,6			Boiling with dil HNO_3 → 3-chloro-4-methylbenzoic acid, 196
27	**3-Chloro-4-isopropyl-1-methylbenzene** (3-Chloro-*p*-cymene)	217		$1\ 5179^{18}$	$1\ 018_4^{18}$	102–3, 106	2,6			
28	**1-Chloronaphthalene**	259		1 633	1 191	180	4,5			Picrate, 137
29	**3-Chlorobiphenyl**	284–5	16			202–3	4,4′			Oxid → 3-chlorobenzoic acid, 158, 155

*Derivative data given in order m p , crystal color, solvent from which crystallized

TABLE V. ORGANIC DERIVATIVES OF HALIDES

C) Aryl halides 3. Bromides a) Liquids (Listed in order of increasing atmospheric b.p.)*

No	Name	Boiling point, °C	Melting point, °C	n_D^{20}	D_4^{20}	Nitro derivative		Sulfonamide		Miscellaneous
						M P	Position of nitro groups	M P	Position of sulfonamide group	
1	**Bromobenzene**	156		1 560	1 494	70–2	2,4	166 161	4	1-Naphthylamide, 161, 2,4-Dinitrobenzenesulfenyl chloride adduct 140–1
2	**2-Bromotoluene**	182			1 425	82	3,5	146	5	Oxid → 2-bromobenzoic acid, 150
3	**3-Bromotoluene**	184			1 410	103	4,6	168	6	Oxid → 3-bromobenzoic acid, 155
4	**1-Bromo-2-ethylbenzene**	199		1 5486	1 355					Oxid → 2-bromobenzoic acid, 150
5	**1-Bromo-4-ethylbenzene**	205		1 5448	1 342					Oxid → 4-bromobenzoic acid, 251
6	**1-Bromo-2-vinylbenzene** (*o*-Bromostyrene)	210		1 5927	1 4160					Polymerizes on heating with benzoyl peroxide
7	**1-Bromo-2-isopropylbenzene**	210		1 5408	1 3020					Oxid → 2-bromobenzoic acid, 150
8	**1-Bromo-4-vinylbenzene** (*p*-Bromostyrene)	212		1 5947	1 398					Polymerizes on heating with benzoyl peroxide, Oxid → 4-bromobenzoic acid, 251
9	**1-Bromo-2,3-dimethylbenzene**	217								Oxid → 3-bromophthalic acid, 188
10	**1,3-Dibromobenzene**	219		1 606	1 952	61	4	190	6	
11	**1-Bromo-4-isopropylbenzene**	219		1 5361	1 2854					Oxid → 4-bromobenzoic acid, 251
12	**1,2-Dibromobenzene**	219		1 609	1 956	114	4,5	176	4	
13	**2-Bromocymene**	234			1 267	97				Anilide, 143
14	**2,5-Dibromotoluene**	236			1 811					Oxid → 2,5-dibromobenzoic acid, 157
15	**3,4-Dibromotoluene**	240			1 81					Oxid → 3,4-dibromobenzoic acid 235
16	**1-Bromonaphthalene**	281		1 658	1 484	85	4	191 3	4	Picrate, 134, Carbonation of Grignard → 1-naphthoic acid, 162
17	**2-Bromobiphenyl**	297								Oxid → 2-bromobenzoic acid, 150

* Derivative data given in order m p , crystal color, solvent from which crystallized

TABLE V. ORGANIC DERIVATIVES OF HALIDES

C) Aryl halides 4. Iodides a) Liquids (Listed in order of increasing atmospheric b.p.)*

No	Name	Boiling point °C	Melting point, °C	n_D^{20}	D_4^{20}	Nitro derivative		Sulfonamide		Miscellaneous
						M P	Position of nitro groups	M P	Position of sulfonamide group	
1	**Iodobenzene**	188-7		1 620	1 831	171	4			Br_2 → 1-Bromo-4 iodobenzene 91
2	**3-Iodotoluene**	204			1 698	108	4,6			Oxid → 3-iodobenzoic acid, 187
3	**2-Iodotoluene**	211			1 698	103	6			Oxid → 2-iodobenzoic acid, 162
4	**1-Iodo-4-isopropylbenzene**	236-8								Cl_2 in chl → dichloride ($ArICl_2$) 110
5	**1-Iodonaphthalene**	305								Picrate, 128

*Derivative data given in order m p , crystal color, solvent from which crystallized