EXPERIMENTAL - PART - I
GENERAL METHOD FOR THE PREPARATION OF SUBSTITUTED BENZYL CHLORIDES:

In a 500 cc. round bottom flask, fitted with a reflux condenser and a calcium chloride guard tube, were placed sulphuryl chloride (72.0 gm.) and benzoyl peroxide (0.7 gm.). Dry substituted toluene (0.64 mol.) was slowly added from above the condenser with shaking and simultaneous cooling. After the addition of substituted toluene was complete the reaction mixture was refluxed on a water bath for about three hours. The product was washed with water, dried over Calcium Chloride and distilled under reduced pressure. (Meischeimer, et al, Ann., 1925, 446, 225)

Following substituted benzyl chlorides were prepared by the above method in 70 to 75 per cent yield.

<table>
<thead>
<tr>
<th>Name</th>
<th>B.P.</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>O-Chlorobenzyl Chloride</td>
<td>82-84°/9 m.m.</td>
<td>Barnes &amp; Gordon, J.Am. Chem.Soc., 1949, 71, 2646</td>
</tr>
<tr>
<td>m-Chlorobenzyl Chloride</td>
<td>216°C</td>
<td>Jackson, Ber., 11, 904</td>
</tr>
<tr>
<td>p-bromobenzyl Chloride</td>
<td>238°C</td>
<td>Dippy &amp; Williams, J.Chem. Soc., 1934, 164</td>
</tr>
</tbody>
</table>
GENERAL METHOD FOR THE PREPARATION OF SUBSTITUTED BENZYL BROMIDES:

In a three-necked flask mounted with a mercury sealed stirrer, a dropping funnel and a reflux condenser with a gas trap, substituted toluene (0.6 mol.) was heated (in an oil-bath) at 120°C and exposed to the light of 100 watts lamp. With constant agitation, bromine (0.64 mol.) was added during three hours, and the stirring was continued for another thirty minutes. By this time, the evolution of hydrogen bromide stopped. The product was kept over KOH overnight in a desiccator to remove hydrogen bromide. The product if liquid was distilled under reduced pressure or if solid, washed with ethyl alcohol on a suction filter. Yield 65 per cent.

(Weisman and Patai, J. Am. Chem. Soc., 1946, 68, 150)

0- and m-bromotoluenes were converted to the respective benzyl bromides by the above method.

<table>
<thead>
<tr>
<th>Name</th>
<th>B.P. or M.P.</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>m-bromobenzyl bromide</td>
<td>M.P. 41°C, B.P. 110 - 120 °C, 7 m.m.</td>
<td>Weismann, loc. cit.</td>
</tr>
</tbody>
</table>
GENERAL METHOD FOR THE PREPARATION OF $\omega$-BROMO XYLENES:

In a 500 ml. three-necked round bottomed flask fitted with a reflux condenser having a gas trap and a separating funnel, xylene (150 g = 1.41 mol.) was placed and heated to 120 - 30°C in an oil-bath. From the separating funnel, bromine (504 g = 3.15 mol.) was added slowly through a tube passing below the surface of xylene. After the addition of bromine, the reaction mixture was poured into an evaporating dish and placed over caustic potash in the desiccator to absorb hydrogen bromide. The product was purified by vacuum distillation. (Atkinson, J. Chem. Soc., 1907, 91, 1695)

The following $\omega$-bromo xylenes were prepared by this method in about 75 to 80 per cent yield.

<table>
<thead>
<tr>
<th>No.</th>
<th>Xylene taken.</th>
<th>$\omega$-bromo xylene obtained.</th>
<th>B.P. or M.P.°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>0-xylene</td>
<td>$\omega$-bromo-0-xylene</td>
<td>B.P. 218°C, M.P. 21°C</td>
</tr>
<tr>
<td>2.</td>
<td>m-xylene</td>
<td>$\omega$-bromo-m-xylene</td>
<td>B.P. 215°C</td>
</tr>
<tr>
<td>3.</td>
<td>p-xylene</td>
<td>$\omega$-bromo-p-xylene</td>
<td>B.P. 218-20°C, M.P. 35°C</td>
</tr>
</tbody>
</table>
GENERAL METHOD FOR THE PREPARATION OF DIMETHYL BENZYL CHLORIDES BY CHLOROMETHYLATION OF XYLENES:

A mixture of xylene (1.0 mol.) concentrated hydrochloric acid (530 gm.) and formaldehyde (106 gm: 1.27 mol., 37-40 per cent) was mechanically stirred and held at 60 - 70°C for seven hours, while a stream of dry hydrogen chloride gas was introduced into the reaction mixture. The oily layer was separated, washed, dried over anhydrous calcium chloride and distilled under reduced pressure. yield: about 65 - 70 per cent.

(Von Braun and Nelles, Ber., 1934, 67, 1096)

The following dimethyl benzyl chlorides were prepared by this method:

<table>
<thead>
<tr>
<th>Xylene No. taken</th>
<th>Dimethyl benzyl chloride Obtained.</th>
<th>B.P.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. o-xylene</td>
<td>3:4-dimethyl benzyl chloride</td>
<td>100-102°/10 m.m.</td>
</tr>
<tr>
<td>2. m-xylene</td>
<td>2:4-dimethyl benzyl chloride</td>
<td>100-103°/12 m.m</td>
</tr>
<tr>
<td>3. p-xylene</td>
<td>2:5-dimethyl benzyl chloride</td>
<td>100-105°/14 m.m</td>
</tr>
</tbody>
</table>
GENERAL METHOD FOR THE PREPARATION OF SUBSTITUTED BENZYL AMINES:
FROM THE BENZYL HALIDE BY THE DELEPINE REACTION:

Substituted benzyl halide (1.0 mole) dissolved in chloroform was gradually added with constant stirring and cooling to hexamethylene tetramine (1.1 mole) in chloroform. After the addition was complete, the flask was corked and kept overnight. If the complex was not obtained next day, the mixture was refluxed for two to six hours and kept again overnight. The solid complex was filtered at the pump and dried. To the nearly dry product dissolved in water, ammonia was added in slight excess. The mixture was refluxed for about one to one and a half hours, poured in excess of cold water and the oily cyclic-imine thus obtained was treated with excess of concentrated hydrochloric acid and the mixture evaporated to dryness on a water-bath. The amine-hydrochloride thus obtained was dissolved, in water, a little concentrated hydrochloric acid added and the mixture steamed in order to remove volatile impurities. The product was made alkaline by 50 per cent caustic soda solution and the oily amine thus obtained was separated or if necessary extracted with ether and the ether extract dried over caustic potash. After removing ether, the amine was purified by
distillation under reduced pressure. yield : about 50 per cent.
( Delepine, Bull. Soc. Chim., 1895, 12, 355; 1897, 17, 290;

The following benzyl amines were prepared by this method:

<table>
<thead>
<tr>
<th>No.</th>
<th>Benzyl halide taken</th>
<th>Benzylamine obtained</th>
<th>B.P. of the Amine</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>o-chlorobenzyl chloride</td>
<td>o-chlorobenzyl amine</td>
<td>103°/11 m.m.</td>
<td>Franzon, Ber., 1905, 28, 1417.</td>
</tr>
<tr>
<td>2.</td>
<td>m-chlorobenzyl chloride</td>
<td>m-chlorobenzyl amine</td>
<td>112°/18 m.m</td>
<td>Shoppee, J. Chem. Soc., 1932, 701</td>
</tr>
<tr>
<td>3.</td>
<td>p-chlorobenzyl chloride</td>
<td>p-chlorobenzyl amine</td>
<td>109°/14 m.m</td>
<td>Shoppee, J. Chem. Soc., 1931, 1233</td>
</tr>
<tr>
<td>4.</td>
<td>o-bromobenzyl bromide</td>
<td>o-bromobenzyl amine</td>
<td>118°/9 m.m.</td>
<td>&quot; &quot; &quot;</td>
</tr>
<tr>
<td>5.</td>
<td>m-bromobenzyl bromide</td>
<td>m-bromobenzyl amine</td>
<td>126°/18 m.m</td>
<td>&quot; &quot; &quot;</td>
</tr>
<tr>
<td>6.</td>
<td>p-bromobenzyl chloride</td>
<td>p-bromobenzyl amine</td>
<td>102°/12 m.m</td>
<td>&quot; &quot; &quot;</td>
</tr>
<tr>
<td>7.</td>
<td>o-methylbenzyl bromide</td>
<td>o-methylbenzyl amine</td>
<td>199-205° C</td>
<td>Krober, Ber., 23, 1026.</td>
</tr>
<tr>
<td>8.</td>
<td>m-methylbenzyl bromide</td>
<td>m-methylbenzyl amine</td>
<td>196-99° C</td>
<td>Graymore, Loc. cit.</td>
</tr>
<tr>
<td>9.</td>
<td>p-methylbenzyl bromide</td>
<td>p-methylbenzyl amine</td>
<td>105°/22 m.m</td>
<td>Shoppee, loc. cit.</td>
</tr>
<tr>
<td>10.</td>
<td>2:4-dimethyl benzyl chloride</td>
<td>2:4-dimethyl benzyl amine</td>
<td>218-19° C</td>
<td>Hinrichsen, Ber., 1888, 21, 3083</td>
</tr>
<tr>
<td>12.</td>
<td>3:4-dimethyl benzyl chloride</td>
<td>3:4-dimethyl benzyl amine</td>
<td>220-22° C</td>
<td>Trivedi &amp; Trivedi, loc. cit.</td>
</tr>
</tbody>
</table>
GENERAL METHOD FOR THE PREPARATION OF PHENYL AND BENZYL ISOTHIOCYANATES:

To a solution of an amine (0.26 mol.) carbon disulphide (30 g.) and rectified spirit (95%) ethyl alcohol (40 ml), the concentrated ammonia solution (sp. gr. 0.88) 41 ml. was added slowly. The flask was maintained at 10-15°. It was stoppered and covered with a damp towel. The milky suspension was shaken occasionally until a clear solution was obtained. The temperature was not allowed to rise above 30°. Considerable heat evolved and the intermediate dithiocarbamate soon crystallised out. It was allowed to stand overnight. The crystals filtered, washed with a little ether and dissolved in a sufficient amount of water. Lead nitrate (87 g.) was dissolved in water (175 ml.) with frequent shaking. This was added to the above solution with frequent shaking. The isothiocyanate was isolated by steam distillation into a receiver containing 5 ml. of Ca. N-sulphuric acid. If the substance solidified in condenser, the cooling water was stopped untill it melted out and run into the receiver. The oil was separated (if solid filtered and then washed with a little water and dried in the air upon filter paper), dried over anhydrous calcium chloride or magnesium sulphate and distilled under diminished pressure. The yield is 60-70 per cent.

( Vogel, pract. org. Chemistry, section IV, 96 )
The following isothiocyanates were prepared by this method:

<table>
<thead>
<tr>
<th>No.</th>
<th>Amine taken</th>
<th>Isothiocyanate obtained</th>
<th>B.P.</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>o-chlorobenzyl</td>
<td>o-chlorobenzyl</td>
<td>138°/6 m.m</td>
<td>Shah, Trivedi &amp; Trivedi, J. Ind. Chem. Soc. 1956, 22, 425.</td>
</tr>
<tr>
<td>2.</td>
<td>m-chlorobenzyl amine</td>
<td>m-chlorobenzyl isothiocyanate</td>
<td>140-45°/6 m.m</td>
<td>-do-</td>
</tr>
<tr>
<td>3.</td>
<td>p-chlorobenzyl amine</td>
<td>p-chlorobenzyl isothiocyanate</td>
<td>130-35°/6 m.m</td>
<td>-do-</td>
</tr>
<tr>
<td>4.</td>
<td>o-bromobenzyl amine</td>
<td>o-bromobenzyl isothiocyanate</td>
<td>130-40°/6 m.m</td>
<td>-do-</td>
</tr>
<tr>
<td>5.</td>
<td>m-bromobenzyl amine</td>
<td>m-bromobenzyl isothiocyanate</td>
<td>147°/5 m.m</td>
<td>-do-</td>
</tr>
<tr>
<td>6.</td>
<td>p-bromobenzyl amine</td>
<td>p-bromobenzyl isothiocyanate</td>
<td>140-44°/5-7 m.m</td>
<td>-do-</td>
</tr>
<tr>
<td>7.</td>
<td>o-methylbenzyl amine</td>
<td>o-methylbenzyl isothiocyanate</td>
<td>120°/7 m.m</td>
<td>Trivedi &amp; Trivedi, J. Ind. Chem. Soc., 1958, 25, 658</td>
</tr>
<tr>
<td>8.</td>
<td>m-methylbenzyl amine</td>
<td>m-methylbenzyl isothiocyanate</td>
<td>148°/15 m.m</td>
<td>-do-</td>
</tr>
<tr>
<td>9.</td>
<td>p-methylbenzyl amine</td>
<td>p-methylbenzyl isothiocyanate</td>
<td>155°/17 m.m</td>
<td>-do-</td>
</tr>
<tr>
<td>10.</td>
<td>2:4-dimethyl benzylamine</td>
<td>2:4-dimethyl isothiocyanate</td>
<td>120°/50 m.m</td>
<td>-do-</td>
</tr>
<tr>
<td>11.</td>
<td>2:5-dimethyl benzylamine</td>
<td>2:5-dimethyl isothiocyanate</td>
<td>160°/9 m.m</td>
<td>-do-</td>
</tr>
<tr>
<td>12.</td>
<td>3:4-dimethyl benzylamine</td>
<td>3:4-dimethyl isothiocyanate</td>
<td>170°/12 m.m</td>
<td>-do-</td>
</tr>
<tr>
<td>13.</td>
<td>o-toluidine</td>
<td>o-methylphenyl isothiocyanate</td>
<td>239°/6 m.m</td>
<td>1*</td>
</tr>
<tr>
<td>14.</td>
<td>m-toluidine</td>
<td>m-methylphenyl isothiocyanate</td>
<td>244/732 m.m</td>
<td>2*</td>
</tr>
<tr>
<td></td>
<td>Compound</td>
<td>Isomer</td>
<td>M.P.</td>
<td>Reference</td>
</tr>
<tr>
<td>---</td>
<td>--------------------------</td>
<td>-------------------------</td>
<td>--------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>15</td>
<td>p-toluidine p-methylphenyl isothiocyanate</td>
<td>237°</td>
<td>3*</td>
<td>Lachmann, Ber. 12, 1349 (1879).</td>
</tr>
<tr>
<td>16</td>
<td>o-Anisidine o-methoxyphenyl isothiocyanate</td>
<td>266-7/760 m.m 4*</td>
<td></td>
<td>Weith, Ber. 2, 719 (1875).</td>
</tr>
<tr>
<td>17</td>
<td>p-Anisidine p-methoxyphenyl isothiocyanate</td>
<td>280-1/760 m.m 5*</td>
<td></td>
<td>Hofmann, Ber. 1, 173 (1868).</td>
</tr>
<tr>
<td>18</td>
<td>m-Anisidine m-methoxyphenyl isothiocyanate</td>
<td>267/760 m.m 6*</td>
<td></td>
<td>Dyson, et al., soc. 1927, 440.</td>
</tr>
<tr>
<td>19</td>
<td>o-chloroaniline o-chlorophenyl isothiocyanate</td>
<td>248 7*</td>
<td></td>
<td>Losanitsch, Ber. 5, 156, (1872).</td>
</tr>
<tr>
<td>20</td>
<td>m-chloroaniline m-chlorophenyl isothiocyanate</td>
<td>249-50° 8*</td>
<td></td>
<td>Vogel, pract. org. chemistry, section IV, 96, page 615.</td>
</tr>
<tr>
<td>21</td>
<td>p-chloroaniline p-chlorophenyl isothiocyanate</td>
<td>249-50° 9*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>p-bromoaniline p-bromophenyl isothiocyanate</td>
<td>M.P. 61° 10*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*1. Lachmann, Ber. 12, 1349 (1879).
2. Weith, Ber. 2, 719 (1875).
5. H. Salkowski, Ber. 7, 1012 (1874).
7. Grosch, Ber. 22, 1089 (1899).
GENERAL METHOD FOR THE PREPARATION OF SULFONAMIDE:

(a) Preparation of Arylsulphonate -

Into a round bottom flask 200 ml. fuming sulphuric acid 40 ml. (sp.gr. 1.88) was placed. Arromatic hydrocarbon (0.5 mole) was added in portions during 15 minutes. The next portion of the hydrocarbon was added only when the first portion had dissolved. It was stirred and the temperature of the reaction mixture was maintained between 30 and 50° C. Finally it was cooled in a vessel of cold water. When all the aromatic hydrocarbon had completely reacted out, the reaction mixture was poured into cold water 200 ml. It was filtered warm. It was partially neutralised by adding small portions of sodium bicarbonate (20 g.) Sodium chloride (50 g.) was added and heated to dissolve. The hot solution was filtered with suction through a Buchner funnel (previously warmed in the steam oven or by pouring boiling water through it). The hot filtrate was transferred to a beaker and cooled rapidly by placing into a cold water bath. The sodium arylsulphonate which separated was filtered on a Buchner funnel and pressed well with a wide glass stopper. It was washed with about 30 ml. of a filtered saturated sodium chloride solution. The crystals were pressed as dry as possible. Finally washed with a little alcohol. It was dried in the
air upon filter paper, powdered, and dried in the oven at 100 - 110°. The yield was 40 - 45 per cent.

( Vogel, pract. org. chemistry, section IV, 29 )

(b) Sulfonyl chloride from arylsulphonate: Into a round bottom flask fitted with refluxed condenser, arylsulphonate (0.5 mol.) and powdered phosphorus pentachloride (50 g.) or phosphorous oxychloride (36 cc) was placed. The mixtures was heated in an oil bath at 170 - 180° for 12-15 hours. Every 3 hours the flask was removed from the oil bath, cooled for 15 - 20 minutes. It was stoppered and shaken thoroughly untill the mass became pasty. At the end of the heating period, the reaction mixture was allowed to cool. It was poured on to one kilo of crushed ice.

The crude sulphonyl chloride was extracted with carbon tetrachloride (150 ml.) and the aqueous layer with (75 ml.) of the same solvent. Most of the solvent was distilled off under atmospheric pressure and the solid was taken out (if liquid it was distilled under reduced pressure.) The yield was quantitative.

( Vogel, Pract. org. chemistry, section IV, 206 )

(C) Sulphonamide From Sulphonyl chloride:

Into a round bottom flask 250 ml. was placed sulphonyl chloride (0.05 mol.). Concentrated ammonia solution (30 ml.)
The mixture was heated to boiling (fume cupboard). It was cooled and the sulphonamide which separated was filtered. It was recrystallised from boiling water by adding decolorising carbon. The yield of pure product was almost theoretical.


The following sulfonamides were prepared by this method:

<table>
<thead>
<tr>
<th>No.</th>
<th>Name of the sulphonamide</th>
<th>M.P.° C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Benzenesulphonamide</td>
<td>156°</td>
</tr>
<tr>
<td>2.</td>
<td>p-toluenesulphonamide</td>
<td>138°</td>
</tr>
<tr>
<td>3.</td>
<td>p-chlorobenzenesulphonamide</td>
<td>144°</td>
</tr>
<tr>
<td>4.</td>
<td>p-bromobenzenesulphonamide</td>
<td>165-6°</td>
</tr>
<tr>
<td>5.</td>
<td>p-methoxybenzenesulphonamide</td>
<td>115-6°</td>
</tr>
<tr>
<td>6.</td>
<td>B-Naphthalenesulphonamide</td>
<td>215-7°</td>
</tr>
<tr>
<td>7.</td>
<td>p-Acetamidobenzenesulphonamide</td>
<td>219°</td>
</tr>
</tbody>
</table>
PREPARATION OF BENZYL SULPHONAMIDE:

Benzyl chloride (50 g) was taken in 500 ml. round bottom flask (pyrex). Sodium sulphite 200 g. was added to it and the whole refluxed on wire-gauge for 10 hours at 190 - 200°C. At the end the reaction product was extracted with 95 alcohol. The yield of sodium benzyl sulphonate was 50 g. From this benzylsulphonyl chloride and benzylsulphonamide were prepared as described in the general method for the preparation of sulphonamide. Benzylsulphonamide gave the M.P. 105°C (Medwedew, et al., Ber., 1932, 65, 13; Fromm, et al., Ber. 1906, 32, 3312).

GENERAL METHOD FOR THE PREPARATION OF 1-(SUBSTITUTED-ARYL)-5-(SUBSTITUTED-ARYLSULFONYL)-THIOUREAS:

Sulfonamide (0.2 mol.) and an isothiocyanate (0.2 mol) in acetone (350 cc) was taken in a round bottom flask. Potassium carbonate (anhydrous) (64 g.) was added to it. The whole was refluxed for 10 hours at 55°C on water-bath. The solvent was removed and the residue was taken up in sufficient amount of warm water. It was treated with decolorising carbon and filtered. The filtrate was acidified to give the thiourea derivative. The yield was 60 to 70 percent. They were crystallised from 70% methyl alcohol.

1-(O-METHYL-PHENYL)-5-(BENZENESULFONYL) THIOUREA:

It was prepared from benzenesulphonamide and O-methyl-
Phenyl isothiocyanate by the procedure described before.
It crystallised from 70% methyl alcohol m.p. 167-8°C.

Found: S, 20.8 per cent.
C_{14}H_{14}S_{2}O_{2}N_{2} Requires: S, 20.9 per cent.

1-(O-METHOXY-PHENYL)-5-(BENZENESULFONYL) THIOUREA:

It was prepared from benzenesulfonamide and O-methoxy-
phenylisothiocyanate by the procedure described before.
It crystallised from 70% methyl alcohol m.p. 235°C.

Found: S, 19.9 per cent.
C_{14}H_{14}S_{2}O_{2}N_{2} Requires: S, 19.9 per cent.

1-(P-METHOXY-PHENYL)-3-(BENZENESULFONYL)-THIOUREA:

It was prepared from benzenesulfonamide and p-methoxy-
phenylisothiocyanate by the procedure described before.
It crystallised from 70% methyl alcohol m.p. 130-1°C.

Found: S, 20.0 per cent.
C_{14}H_{14}S_{2}O_{3}N_{2} Requires: S, 19.9 per cent.
1-(p-Chloro-phenyl)-5-(benzenesulfonyl)-thiourea:

It was prepared from benzenesulfonamide and p-Chlorophenylisothiocyanate by the procedure described before.
It crystallised from 70% methyl alcohol m.p. 185°C.

Found: S, 19.7 per cent.

C_{13}H_{11}S_2O_2N_2Cl
Requires: S, 19.6 per cent.

1-(p-Bromo-phenyl)-5-(benzenesulfonyl)-thiourea:

It was prepared from benzenesulfonamide and p-bromo-phenylisothiocyanate by the procedure described before.
It crystallised from 70% methyl alcohol m.p. 214.5°C.

Found: S, 17.4 per cent.

C_{13}H_{11}S_2O_2N_2Br
Requires: S, 17.3 per cent.

1-(3:5-Dimethyl-phenyl)-5-(benzenesulfonyl)-thiourea:

It was prepared from benzene sulfonamide and 3:5-dimethyl-phenylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 205°C.

Found: S, 20 per cent.

C_{15}H_{16}S_2O_2N_2
Requires: S, 20 per cent.
1-(O-METHYL-BENZYL)-5-(BENZENESULFONYL)-THIOUREA:

It was prepared from benzenesulfonamide and o-methyl-benzylisothiocyanate by the procedure described before.
It crystallised from 70% methyl alcohol, m.p. 123.5° C.

Found: S, 20.1 per cent.

\[ \text{C}_{15}\text{H}_{16}\text{S}_{2}\text{O}_{2}\text{N}_{2} \]

Requires: S, 20.0 per cent.

1-(m-METHYL-BENZYL)-3-(BENZENESULFONYL)-THIOUREA:

It was prepared from benzenesulfonamide and m-methyl-benzylisothiocyanate by the procedure described before.
It crystallised from 70% methyl alcohol, m.p. 122.3° C.

Found: S, 20.0 per cent.

\[ \text{C}_{15}\text{H}_{16}\text{S}_{2}\text{O}_{2}\text{N}_{2} \]

Requires: S, 20.0 per cent.

1-(p-METHYL-BENZYL)-3-(BENZENESULFONYL)-THIOUREA:

It was prepared from benzenesulfonamide and p-methyl-benzylisothiocyanate by the procedure described before.
It crystallised from 70% methyl alcohol, m.p. 160-1° C.

Found: S, 20.1 per cent.

\[ \text{C}_{15}\text{H}_{16}\text{S}_{2}\text{O}_{2}\text{N}_{2} \]

Requires: S, 20.0 per cent.
1-(2:4-DIMETHYL-BENZYL)-3-(BENZENESULFONYL)-THIOUREA:

It was prepared from benzenesulfonamide and 2:4-dimethylbenzylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 133-4°C.

Found: S, 19.1 per cent.

C_{16}H_{18}S_{2}O_{2}N_{2} Requires: S, 19.2 per cent.

1-(2:5-DIMETHYL-BENZYL)-3-(BENZENESULFONYL)-THIOUREA:

It was prepared from benzenesulfonamide and 2:5-dimethylbenzylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 134-5°C.

Found: S, 19.3 per cent.

C_{16}H_{18}S_{2}O_{2}N_{2} Requires: S, 19.2 per cent.

1-(3:4-DIMETHYL-BENZYL)-3-(BENZENESULFONYL)-THIOUREA:

It was prepared from benzenesulfonamide and 3:4-dimethylbenzylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 163-4°C.

Found: S, 19.3 per cent.

C_{16}H_{18}S_{2}O_{2}N_{2} Requires: S, 19.2 per cent.
1-(O-CHLORO-BENZYL)-3-(BENZENESULFONYL)-THIOUREA:

It was prepared from benzenesulfonamide and o-chloro-benzylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 133-4°C.

Found: S, 18.8 per cent.

\[ C_{14}H_{13}S_2O_2N_2Cl \]

Requires: S, 18.79 per cent.

1-(P-CHLORO-BENZYL)-3-(BENZENESULFONYL)-THIOUREA:

It was prepared from benzenesulfonamide and p-chloro-benzylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 139-40°C.

Found: S, 18.9 per cent.

\[ C_{14}H_{13}S_2O_2N_2Cl \]

Requires: S, 18.79 per cent.

1-(O-METHYL-PHENYL)-3-(P-TOLUENESULFONYL)-THIOUREA:

It was prepared from p-toluenesulfonamide and o-methyl-phenylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 190°C.

Found: S, 20.1 per cent.

\[ C_{15}H_{16}S_2O_2N_2 \]

Requires: S, 20.0 per cent.
1-(m-Methyl-phenyl)-3-(p-toluenesulfonfyl)-thiourea:

It was prepared from p-toluenesulfonamide and m-methyl-phenylisothiocyanate by the procedure described before. It crystallised from 70 % methyl alcohol m.p. 128-9° C.

Found: S, 20.1 per cent.

\[ \text{C}_{15}\text{H}_{16}\text{S}_{2}\text{O}_{2}\text{N}_{2} \]

Requires: S, 20.0 per cent.

1-(p-Methyl-phenyl)-3-(p-toluenesulfonfyl)-thiourea:

It was prepared from p-toluenesulfonamide and p-methyl-phenylisothiocyanate by the procedure described before. It crystallised from 70 % methyl alcohol m.p. 130-2° C.

Found: S, 20.1 per cent.

\[ \text{C}_{15}\text{H}_{16}\text{S}_{2}\text{O}_{2}\text{N}_{2} \]

Requires: S, 20.0 per cent.

1-(o-Methoxy-phenyl)-3-(p-toluenesulfonfyl)-thiourea:

It was prepared from p-toluenesulfonamide and o-methoxy-phenylisothiocyanate by the procedure described before. It crystallised from 70 % methyl alcohol m.p. 143-4° C.

Found: S, 19.2 per cent.

\[ \text{C}_{15}\text{H}_{16}\text{S}_{2}\text{O}_{3}\text{N}_{2} \]

Requires: S, 19.1 per cent.
1-(P-METHOXY-PHENYL)-3-(P-TOLUENESULFONYL)-THIOUREA:

It was prepared from p-toluenesulfonamide and p-methoxy-phenylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 154-5°C.

Found : S, 19.2 per cent.
C\textsubscript{15}H\textsubscript{16}S\textsubscript{2}O\textsubscript{3}N\textsubscript{2} Requires : S, 19.1 per cent.

1-(P-CHLORO-PHENYL)-3-(P-TOLUENESULFONYL)-THIOUREA:

It was prepared from p-toluenesulfonamide and p-chloro-phenylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 181-2°C.

Found : S, 18.8 per cent.
C\textsubscript{14}H\textsubscript{13}S\textsubscript{2}O\textsubscript{2}N\textsubscript{2}Cl Requires : S, 18.79 per cent.

1-(P-BROMO-PHENYL)-3-(P-TOLUENESULFONYL)-THIOUREA:

It was prepared from p-toluenesulfonamide and p-bromo-phenylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 178-9°C.

Found : S, 16.7 per cent.
C\textsubscript{14}H\textsubscript{13}S\textsubscript{2}O\textsubscript{2}N\textsubscript{2}Br Requires : S, 16.6 per cent.
1-(3:5-DIMETHYL-PHENYL)-3-(P-TOLUENESULFONYL)-THIOUREA:

It was prepared from p-toluenesulfonamide and 3:5-dimethyl-phenylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 209-10° C.

\[ \text{C}_{16}\text{H}_{18}\text{S}_{2}\text{O}_{2}\text{N}_{2} \]

Found: S, 19.3 per cent.
Requires: S, 19.2 per cent.

1-(O-METHYL-BENZYL)-3-(P-TOLUENESULFONYL)-THIOUREA:

It was prepared from p-toluenesulfonamide and o-methyl-benzyliothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 155-6° C.

\[ \text{C}_{16}\text{H}_{18}\text{S}_{2}\text{O}_{2}\text{N}_{2} \]

Found: S, 19.3 per cent.
Requires: S, 19.2 per cent.

1-(m-METHYL-BENZYL)-3-(P-TOLUENESULFONYL)-THIOUREA:

It was prepared from p-toluenesulfonamide and m-methyl-benzyliothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 127-8° C.

\[ \text{C}_{16}\text{H}_{18}\text{S}_{2}\text{O}_{2}\text{N}_{2} \]

Found: S, 19.2 per cent.
Requires: S, 19.2 per cent.
$1-(P$-methyl-benzyl$)-3-(P$-toluenesulfonyl$)-thiourea$:

It was prepared from p-toluenesulfonamide and p-methyl-benzylisothiocyanate by the procedure described before. It crystallised from 70\% methyl alcohol m.p. 174-5\° C.

\[
\text{Found}: \text{ S}, \ 19.2 \text{ per cent.}
\]
\[
\text{C}_{16}H_{18}S_{2}O_{2}N_{2} \quad \text{Requires}: \text{ S}, \ 19.2 \text{ per cent.}
\]

$1-(2:4$-dimethyl-benzyl$)-3-(P$-toluenesulfonyl$)-thiourea$:

It was prepared from p-toluenesulfonamide and 2:4-dimethyl-benzylisothiocyanate by the procedure described before. It crystallised from 70\% methyl alcohol 124-5\° C.

\[
\text{Found}: \text{ S}, \ 18.5 \text{ per cent.}
\]
\[
\text{C}_{17}H_{20}S_{2}O_{2}N_{2} \quad \text{Requires}: \text{ S}, \ 18.4 \text{ per cent.}
\]

$1-(2:5$-dimethyl-benzyl$)-3-(P$-toluenesulfonyl$)-thiourea$:

It was prepared from p-toluenesulfonamide and 2:5-dimethyl-benzylisothiocyanate by the procedure described before. It crystallised from 70\% methyl alcohol m.p. 137-8\° C.

\[
\text{Found}: \text{ S}, \ 18.5 \text{ per cent.}
\]
\[
\text{C}_{17}H_{20}S_{2}O_{2}N_{2} \quad \text{Requires}: \text{ S}, \ 18.4 \text{ per cent.}
\]
1-(3:4-DIMETHYL-BENZYL)-3-(P-TOLUENESULFONYL)-THIOUREA:

It was prepared from p-toluenesulfonamide and 3:4-dimethyl benzylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 153-4° C.

Found : S, 18.5 per cent.

C₁₇H₂₀S₂O₂N₂

Requires : S, 18.4 per cent.

1-(O-CHLORO-BENZYL)-3-(P-TOLUENESULFONYL)-THIOUREA:

It was prepared from p-toluenesulfonamide and o-chlorophenylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 169-70° C.

Found : S, 18.2 per cent.

C₁₅H₁₅S₂O₂N₂Cl

Requires : S, 18.1 per cent.

1-(P-CHLORO-BENZYL)-3-(P-TOLUENESULFONYL)-THIOUREA:

It was prepared from p-toluenesulfonamide and p-chlorobenzylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 168-9° C.

Found: S, 18.2 per cent.

C₁₅H₁₅S₂O₂N₂Cl

Requires: S, 18.1 per cent.
1-(P-BROMO-BENZYL)-5-(P-TOLUENESULFONYL)-THIOUREA:

It was prepared from p-toluenesulfonamide and p-bromo benzyl isothiocyanate by the procedure described before.
It crystallised from 70% methyl alcohol m.p. 152-3°C.

Found: S, 16.00 per cent.
Requires: S, 16.04 per cent.

C₁₅H₁₅S₂O₂N₂Br

1-(O-METHYL-PHENYL)-3-(P-METHOXYBENZENESULFONYL)-THIOUREA:

It was prepared from p-methoxybenzenesulfonamide and o-methylphenylisothiocyanate by the procedure described before.
It crystallised from 70% methyl alcohol m.p. 172°C.

Found: S, 19.0 per cent.
Requires: S, 19.1 per cent.

C₁₅H₁₆S₂O₃N₂

1-(M-METHYL-PHENYL)-3-(P-METHOXYBENZENESULFONYL)-THIOUREA:

It was prepared from p-methoxybenzenesulfonamide and m-methylphenylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 150-1°C.

Found: S, 19.2 per cent.
Requires: S, 19.1 per cent.

C₁₅H₁₆S₂O₃N₂
1-(P-METHYL-PHENYL)-3-(P-METHOXYBENZENESULFONYL)-THIOUREA :

It was prepared from p-methoxybenzenesulfonamide and p-methylphenylisothiocyanate by the procedure described before. It crystallised from 70 % methyl alcohol m.p. 146-7° C.

Found : S, 19.2 per cent.

C_{15}H_{16}S_{2}O_{2}N_{2}

Requires : S, 19.1 per cent.

1-(O-METHOXY-PHENYL)-3-(P-METHOXYBENZENESULFONYL)-THIOUREA :

It was prepared from p-methoxybenzenesulfonamide and O-methoxyphenylisothiocyanate by the procedure described before. It crystallised from 70 % methyl alcohol m.p. 126-7°C.

Found : S, 18.2 per cent.

C_{15}H_{16}S_{2}O_{4}N_{2}

Requires : S, 18.2 per cent.

1-(P-METHOXY-PHENYL)-3-(P-METHOXYBENZENESULFONYL)-THIOUREA :

It was prepared from p-methoxybenzenesulfonamide and p-methoxyphenylisothiocyanate by the procedure described before. It crystallised from 70 % methyl alcohol m.p. 173-4°C.

Found : S, 18.3 per cent.

C_{15}H_{16}S_{2}O_{4}N_{2}

Requires : S, 18.2 per cent.
1-(3:5-DIMETHYL-PHENYL)-3-(P-METHOXYBENZENESULFONYL)-THIOUREA:

It was prepared from p-methoxybenzenesulfonamide and 3:5-dimethylphenylisothiocyanate by the procedure described before. It crystallised from 70 % methyl alcohol m.p. 201° C.

\[ \text{Found : S, 18.4 per cent.} \]
\[ \text{C}_{16}\text{H}_{18}\text{S}_{2}\text{O}_{3}\text{N}_{2} \]

\[ \text{Requires : S, 18.3 per cent.} \]

1-(O-METHYL-BENZYL)-3-(P-METHOXYBENZENESULFONYL)-THIOUREA:

It was prepared from p-methoxybenzenesulfonamide and o-methylbenzylisothiocyanate by the procedure described before. It crystallised from 70 % methyl alcohol m.p. 133-4° C.

\[ \text{Found : S, 18.4 per cent.} \]
\[ \text{C}_{16}\text{H}_{18}\text{S}_{2}\text{O}_{3}\text{N}_{2} \]

\[ \text{Requires : S, 18.3 per cent.} \]

1-(m-METHYL-BENZYL)-3-(p-METHOXYBENZENESULFONYL)-THIOUREA:

It was prepared from p-methoxybenzenesulfonamide and m-methylbenzylisothiocyanate by the procedure described before. It crystallised from 70 % methyl alcohol m.p. 120° C.

\[ \text{Found: S, 18.4 per cent.} \]
\[ \text{C}_{16}\text{H}_{18}\text{S}_{2}\text{O}_{3}\text{N}_{2} \]

\[ \text{Requires: S, 18.3 per cent.} \]
1-(P-METHYL-BENZYL)-3-(P-METHOXYBENZESULFONYL)-THIOUREA:

It was prepared from p-methoxybenzenesulfonamide and p-methylbenzylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 160-1°C.

Found : S, 18.2 per cent.

\[ \text{C}_{16}\text{H}_{18}\text{S}_{2}\text{O}_{3}\text{N}_{2} \]

Requires : S, 18.3 per cent.

1-(2:4-DIMETHYL-BENZYL)-3-(P-METHOXYBENZESULFONYL)-THIOUREA:

It was prepared from p-methoxybenzenesulfonamide and 2:4-dimethylbenzylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 130-1°C.

Found : S, 17.6 per cent.

\[ \text{C}_{17}\text{H}_{20}\text{S}_{2}\text{O}_{3}\text{N}_{2} \]

Requires : S, 17.58 per cent.

1-(2:5-DIMETHYL-BENZYL)-3-(P-METHOXYBENZESULFONYL)-THIOUREA:

It was prepared from p-methoxybenzenesulfonamide and 2:5-dimethylbenzylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 154°C.

Found : S, 17.6 per cent.

\[ \text{C}_{17}\text{H}_{20}\text{S}_{2}\text{O}_{3}\text{N}_{2} \]

Requires : S, 17.58 per cent.
1-(3:4-DIMETHYL-BENZYL)-3-(P-METHOXYBENZENESULFONYL)-THIOUREA:

It was prepared from p-methoxybenzenesulfonamide and 3:4-dimethyl benzylisothiocyanate by the procedure described before. It crystallised from 70 % methyl alcohol m.p. 134-5°C.

\[
\text{Found: S, 17.6 per cent.} \\
C_{17}H_{20}S_2O_3N_2 \\
\text{Requires: S, 17.58 per cent.}
\]

1-(O-CHLORO-BENZYL)-3-(P-METHOXYBENZENESULFONYL)-THIOUREA:

It was prepared from p-methoxybenzenesulfonamide and o-chlorobenzylisothiocyanate by the procedure described before. It crystallised from 70 % methyl alcohol m.p. 156-7°C.

\[
\text{Found: S, 17.4 per cent.} \\
C_{15}H_{15}S_2O_3N_2Cl \\
\text{Requires: S, 17.3 per cent.}
\]

1-(P-CHLORO-BENZYL)-3-(P-METHOXYBENZENESULFONYL)-THIOUREA:

It was prepared from p-methoxybenzenesulfonamide and p-chlorobenzylisothiocyanate by the procedure described before. It crystallised from 70 % methyl alcohol m.p. 154-5°C.

\[
\text{Found: S, 17.4 per cent.} \\
C_{15}H_{15}S_2O_3N_2Cl \\
\text{Requires: S, 17.3 per cent.}
\]
**1-(P-BROMO-BENZYL)-5-(P-METHOXYBENZENESULFONYL)-THIOUREA:**

It was prepared from p-methoxybenzenesulfonamide and p-bromobenzylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 135–6°C

Found: S, 15.4 per cent.

C_{15}H_{15}S_2O_3N_2Br

Requires: S, 15.43 per cent.

**1-(O-METHYL-PHENYL)-3-(P-CHLOROBENZENESULFONYL)-THIOUREA:**

It was prepared from p-chlorobenzenesulfonamide and o-methylphenylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 167°C

Found: S, 18.8 per cent.

C_{14}H_{13}S_2O_2N_2Cl

Requires: S, 18.8 per cent.

**1-(P-METHYL-PHENYL)-3-(P-CHLOROBENZENESULFONYL)-THIOUREA:**

It was prepared from p-chlorobenzenesulfonamide and p-methylphenyl isothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 150–1°C.

Found: S, 18.8 per cent.

C_{14}H_{13}S_2O_2N_2Cl

Requires: S, 18.8 per cent.
1-(O-METHOXY-PHENYL)-5-(p-CHLOROBENZENESULFONYL)-THIOUREA:

It was prepared from p-chlorobenzenesulfonamide and o-methoxyphenylisothiocyanate by the procedure described before. It crystallised from 70 % methyl alcohol m.p. 167-68°C.

Found : S, 17.9 per cent.

\[ C_{14}H_{13}S_2O_2N_2Cl \]
Requires : S, 17.96 per cent.

1-(P-METHOXY-PHENYL)-5-(p-CHLOROBENZENESULFONYL)-THIOUREA:

It was prepared from p-chlorobenzenesulfonamide and p-methoxyphenylisothiocyanate by the procedure described before. It crystallised from 70 % methyl alcohol m.p. 167-8°C.

Found : S, 18.0 per cent.

\[ C_{14}H_{13}S_2O_3N_2Cl \]
Requires : S, 17.96 per cent.

1-(P-CHLORO-PHENYL)-5-(p-CHLOROBENZENESULFONYL)-THIOUREA:

It was prepared from p-chlorobenzenesulfonamide and p-chlorophenylisothiocyanate by the procedure described before. It crystallised from 70 % methyl alcohol m.p. 180-1°C.

Found : S, 17.8 per cent.

\[ C_{13}H_{10}S_2O_2N_2Cl \]
Requires : S, 17.73 per cent.
1-(P-BROMO-PHENYL)-3-(P-CHLOROBENZENESULFONYL)-THIOUREA:

It was prepared from p-chlorobenzenesulfonamide and p-bromophenylisothiocyanate by the procedure described before. It crystallised from 70 % methyl alcohol m.p. 180° C.

\[ \text{Found : S, 15.9 per cent.} \]
\[ \text{C}_{13}\text{H}_{10}\text{S}_2\text{O}_2\text{N}_2\text{ClBr} \quad \text{Requires : S, 15.8 per cent.} \]

1-(3:5-DIMETHYL-PHENYL)-3-(P-CHLOROBENZENESULFONYL)-THIOUREA:

It was prepared from p-chlorobenzenesulfonamide and 3:5-dimethylisothiocyanate by the procedure described before. It crystallised from 70 % methyl alcohol m.p. 191-2° C.

\[ \text{Found : S, 18.1 per cent.} \]
\[ \text{C}_{15}\text{H}_{15}\text{S}_2\text{O}_2\text{N}_2\text{Cl} \quad \text{Requires : S, 18.05 per cent.} \]

1-(O-METHYL-BENZYL)-3-(P-CHLOROBENZENESULFONYL)-THIOUREA:

It was prepared from p-chlorobenzenesulfonamide and o-methylbenzylisothiocyanate by the procedure described before. It crystallised from 70 % methyl alcohol m.p. 157-8° C.

\[ \text{Found : S, 18.1 per cent.} \]
\[ \text{C}_{15}\text{H}_{15}\text{S}_2\text{O}_2\text{N}_2\text{Cl} \quad \text{Requires : S, 18.05 per cent.} \]
1-(m-METHYL-BENZYL)-3-(p-CHLOROBENZENESULFONYL)-THIOUREA:

It was prepared from p-chlorobenzenesulfonamide and m-methylbenzylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 125-6°C.

\[
\text{Found: } S, 18.1 \text{ per cent.}
\]

\[
\text{C}_{15}H_{15}S_2O_2N_2Cl \quad \text{Requires: } S, 18.05 \text{ per cent.}
\]

1-(p-METHYL-BENZYL)-3-(p-CHLOROBENZENESULFONYL)-THIOUREA:

It was prepared from p-chlorobenzenesulfonamide and p-methylbenzyl isothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 172-3°C.

\[
\text{Found: } S, 18.1 \text{ per cent.}
\]

\[
\text{C}_{15}H_{15}S_2O_2N_2Cl \quad \text{Requires: } S, 18.05 \text{ per cent.}
\]

1-(2:4-DIMETHYL-BENZYL)-3-(p-CHLOROBENZENESULFONYL)-THIOUREA:

It was prepared from p-chlorobenzenesulfonamide and 2:4-dimethylbenzylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 150-52°C.

\[
\text{Found: } S, 17.5 \text{ per cent.}
\]

\[
\text{C}_{16}H_{17}S_2O_2N_2Cl \quad \text{Requires: } S, 17.4 \text{ per cent.}
\]
1-(2:5-DIMETHYL-BENZYL)-3-(P-CHLOROBENZENESULFONYL)-THIOUREA:

It was prepared from p-chlorobenzenesulfonamide and 2:5-dimethylbenzylisothiocyanate by the procedure described before. It crystallised from 70 % methyl alcohol m.p. 145°C.

Found : S, 17.3 per cent.

C<sub>16</sub>H<sub>17</sub>S<sub>2</sub>O<sub>2</sub>N<sub>2</sub>C<sub>l</sub> Requires : S, 17.4 per cent.

1-(3:4-DIMETHYL-BENZYL)-3-(P-CHLOROBENZENESULFONYL)-THIOUREA:

It was prepared from p-chlorobenzenesulfonamide and 3:4-dimethylbenzylisothiocyanate by the procedure described before. It crystallised from 70 % methyl alcohol m.p. 164-5°C.

Found : S, 17.3 per cent.

C<sub>16</sub>H<sub>17</sub>S<sub>2</sub>O<sub>2</sub>N<sub>2</sub>C<sub>l</sub> Requires : S, 17.4 per cent.

1-(O-CHLORO-BENZYL)-3-(P-CHLOROBENZENESULFONYL)-THIOUREA:

It was prepared from p-chlorobenzenesulfonamide and o-chlorobenzylisothiocyanate by the procedure described before. It crystallised from 70 % methyl alcohol m.p. 174-5°C.

Found : S, 17.1 per cent.

C<sub>14</sub>H<sub>12</sub>S<sub>2</sub>O<sub>2</sub>N<sub>2</sub>C<sub>l</sub> Requires : S, 17.07 per cent.
1-(p-CHLORO-BENZYL)-3-(p-CHLOROBENZENESULFONYL)-THIOUREA:

It was prepared from p-chlorobenzenesulfonamide and p-chlorobenzylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 157-8°C.

Found: S, 17.1 per cent.

C\(_{14}H\_{12}S_2O_2N_2Cl_2\) 
Requires: S, 17.07 per cent.

1-(p-BROMO-BENZYL)-3-(p-CHLOROBENZENESULFONYL)-THIOUREA:

It was prepared from p-chlorobenzenesulfonamide and p-bromobenzylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 145-6°C.

Found: S, 15.4 per cent.

C\(_{14}H\_{12}S_2O_2N_2ClBr\) 
Requires: S, 15.3 per cent.

1-(M-METHYL-PHENYL)-3-(p-BROMOBENZENESULFONYL)-THIOUREA:

It was prepared from p-bromobenzenesulfonamide and m-methylphenylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 148-9°C.

Found: S, 16.5 per cent.

C\(_{14}H_{13}S_2O_2N_2BrO_2\) 
Requires: S, 16.63 per cent.
1-(P-METHYL-PHENYL)-5-(P-BROMOBENZENESULfonyL)-THIOUREA:

It was prepared from p-bromobenzenesulfonamide and p-methylphenylisothiocyanate by procedure described before. It crystallised from 70% methyl alcohol m.p. 261-2°C.

Found: S, 16.7 per cent.

\[ C_{14}H_{13}S_{2}N_{2}O_{3}Br \]

Requires: S, 16.65 per cent.

1-(0-METHOXY-PHENYL)-3-(P-BROMOBENZENESULfonyL)-THIOUREA:

It was prepared from p-bromobenzenesulfonamide and o-methoxyphenylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 160°C.

Found: S, 15.9 per cent.

\[ C_{14}H_{13}S_{2}N_{2}O_{3}Br \]

Requires: S, 15.96 per cent.

1-(P-METHOXY-PHENYL)-3-(P-BROMOBENZENESULfonyL)-THIOUREA:

It was prepared from p-bromobenzenesulfonamide and p-methoxyphenylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 173-4°C.

Found: S, 16.0 per cent.

\[ C_{14}H_{13}S_{2}N_{2}O_{3}Br \]

Requires: S, 15.96 per cent.
1-(O-CHLORO-PHENYL)-3-(P-BROMOBENZENESULFONYL)-THIOUREA:

It was prepared from p-bromobenzenesulfonamide and o-chlorophenylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 188-9°C.

Found: S, 15.9 per cent.

\[ \text{C}_{13}\text{H}_{10}\text{S}_{2}\text{N}_{2}\text{O}_{2}\text{ClBr} \]

Requires: S, 15.8 per cent.

1-(P-BROMO-PHENYL)-3-(P-BROMOBENZENESULFONYL)-THIOUREA:

It was prepared from p-bromobenzenesulfonamide and p-bromophenylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 195°C.

Found: S, 14.3 per cent.

\[ \text{C}_{13}\text{H}_{10}\text{S}_{2}\text{N}_{2}\text{O}_{2}\text{Br}_{2} \]

Requires: S, 14.2 per cent.

1-(3:5-DIMETHYL-PHENYL)-3-(P-BROMOBENZENESULFONYL)-THIOUREA:

It was prepared from p-bromobenzenesulfonamide and 3:5-dimethylphenylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 205-6°C.

Found: S, S, 16.1 per cent.

\[ \text{C}_{15}\text{H}_{15}\text{S}_{2}\text{N}_{2}\text{O}_{2}\text{Br} \]

Requires: S, 16.04 per cent.
1-(O-METHYL-BENZYL)-5-(P-BROMOBENZENESULFONYL)-THIOUREA:

It was prepared from p-bromobenzenesulfonamide and o-methylbenzylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 160-1° C.

Found: S, 16.1 per cent.

C_{15}H_{15}S_{2}N_{2}O_{2}Br

Requires: S, 16.04 per cent.

1-(m-METHYL-BENZYL)-5-(P-BROMOBENZENESULFONYL)-THIOUREA:

It was prepared from p-bromobenzenesulfonamide and m-methylbenzylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 134-5° C.

Found: S, 16.1 per cent.

C_{15}H_{15}S_{2}N_{2}O_{2}Br

Requires: S, 16.04 per cent.

1-(p-METHYL-BENZYL)-5-(P-BROMOBENZENESULFONYL)-THIOUREA:

It was prepared from p-bromobenzenesulfonamide and p-methylbenzylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 185-6° C.

Found: S, 16.1 per cent.

C_{15}H_{15}S_{2}N_{2}O_{2}Br

Requires: S, 16.04 per cent.
It was prepared from p-bromobenzenesulfonamide and 
2:4-dimethylbenzylisothiocyanate by the procedure described 
before. It crystallised from 70% methyl alcohol m.p. 163-4°C. 

\[ \text{Found: } S, 15.5 \text{ per cent.} \]
\[ \text{C}_{16}H_{17}S_{2}N_{2}O_{2}Br \]
\[ \text{Requires: } S, 15.5 \text{ per cent.} \]

It was prepared from p-bromobenzenesulfonamide and 
2:5-dimethylbenzylisothiocyanate by the procedure described 
before. It crystallised from 70% methyl alcohol m.p. 134-5°C. 

\[ \text{Found: } S, 15.6 \text{ per cent.} \]
\[ \text{C}_{16}H_{17}S_{2}N_{2}O_{2}Br \]
\[ \text{ Requires: } S, 15.5 \text{ per cent.} \]

It was prepared from p-bromobenzenesulfonamide and 
3:4-dimethylbenzylisothiocyanate by the procedure described 
before. It crystallised from 70% methyl alcohol, 169-70°C. 

\[ \text{Found: } S, 15.6 \text{ per cent.} \]
\[ \text{C}_{16}H_{17}S_{2}N_{2}O_{2}Br \]
\[ \text{Requires: } S, 15.5 \text{ per cent.} \]
1-(o-CHLORO-BENZYL)-3-(p-BROMOBENZENESULFONYL)-THIOUREA:

It was prepared from p-bromobenzenesulfonamide and o-chlorobenzylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 175°C.

Found: S, 20.1 per cent.
C_{14}H_{12}S_{2}N_{2}O_{2}ClBr
Requires: S, 20.0 per cent.

1-(p-CHLORO-BENZYL)-3-(p-BROMOBENZENESULFONYL)-THIOUREA:

It was prepared from p-bromobenzenesulfonamide and p-chlorobenzylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 164-5°C.

Found: S, 20.1 per cent.
C_{14}H_{12}S_{2}N_{2}O_{2}ClBr
Requires: S, 20.0 per cent.

1-(p-BROMO-BENZYL)-3-(p-BROMOBENZENESULFONYL)-THIOUREA:

It was prepared from p-bromobenzenesulfonamide and p-bromobenzylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 154-5°C.

Found: S, 13.9 per cent.
C_{14}H_{12}S_{2}N_{2}O_{2}Br_{2}
Requires: S, 13.8 per cent.
1-(M-METHYL-PHENYL)-3-(P-ACETAMIDOBENZENESULFONYL)-THIOUREA:

It was prepared from p-Acetamidobenzenesulfonamide and m-methylphenylisothiocyanate by the procedure described before. It crystallised from 70 % methyl alcohol m.p. 164°C.

Found : S, 17.5 per cent.

C_{16}H_{17}O_3N_3S_2

Requires : S, 17.63 per cent.

1-(p-METHYL-PHENYL)-3-(P-ACETAMIDOBENZENESULFONYL)-THIOUREA:

It was prepared from p-acetamidobenzenesulfonamide and p-methylphenylisothiocyanate by the procedure described before. It crystallised from 70 % methyl alcohol m.p. 174°C.

Found : S, 17.7 per cent.

C_{16}H_{17}O_3N_3S_2

Requires : S, 17.63 per cent.

1-(P-METHOXY-PHENYL)-3-(ACETAMIDOBENZENESULFONYL)-THIOUREA:

It was prepared from p-acetamidobenzenesulfonamide and p-methoxyphenylisothiocyanate by the procedure described before. It crystallised from 70 % methyl alcohol m.p. 174°C.

Found : S, 17.0 per cent.

C_{16}H_{17}O_4N_3S_2

Requires : S, 16.9 per cent.
1-(O-METHYL-PHENYL)-3-(P-AMINOBENZENESULFONYL)-THIOUREA :

It was prepared from p-acetamidobenzenesulfonamide and o-methylphenylisothiocyanate by the procedure described before. The thiourea derivative obtained was saponified by NaOH to get the p-amino-compound. It crystallised from 70% methyl alcohol m.p. 194°C.

**Found:** S, 20.0 per cent.

C\(_{14}H_{15}O_2N_2S_2\)  

**Requires:** S, 19.94 per cent.

1-(P-METHYL-PHENYL)-3-(P-AMINOBENZENESULFONYL)-THIOUREA :

It was prepared from p-acetamidobenzenesulfonamide and p-methylphenylisothiocyanate by the procedure described before. The thiourea derivative obtained was saponified by NaOH to get the p-amino-compound. It crystallised from 70% methyl alcohol m.p. 158-9°C.

**Found:** S, 20.0 per cent.

C\(_{14}H_{15}O_2N_2S_2\)  

**Requires:** S, 19.94 per cent.

1-(O-METHOXY-PHENYL)-3-(P-AMINOBENZENESULFONYL)-THIOUREA :

It was prepared from p-acetamidobenzenesulfonamide and o-methoxyphenylisothiocyanate by the procedure described before. The thiourea derivative obtained was saponified by
NaOH to get the p-amino-compound. It crystallised from 70 % methyl alcohol m.p. 180° C.

\[
\text{Found : S, 19.1 per cent.} \\
\text{C}_{14}H_{15}O_3N_3S_2 \quad \text{Requires : S, 19.0 per cent.}
\]

1-(P-METHOXY-PHENYL)-3-(P-AMINOBENZENESULFONYL)-THIOUREA:

It was prepared from p-acetamidobenzenesulfonamide and p-methoxyphenylisothiocyanate by the procedure described before. The thiourea derivative obtained was saponified by NaOH to get the p-amino-compound. It crystallised from 70 % methyl alcohol m.p. 178° C.

\[
\text{Found : S, 19.1 per cent.} \\
\text{C}_{14}H_{15}O_3N_3S_2 \quad \text{Requires : S, 19.0 per cent.}
\]

1-(2:4-DIMETHYL-BENZYL)-3-(P-AMINOBENZENESULFONYL)-THIOUREA:

It was prepared from p-acetamidobenzenesulfonamide and 2:4-dimethylbenzylisothiocyanate by the procedure described before. The thiourea derivative obtained was saponified by NaOH to get the p-amino-compound. It crystallised from 70 % methyl alcohol m.p. 126-7° C.

\[
\text{Found : S, 18.4 per cent.} \\
\text{C}_{16}H_{19}O_2N_3S_2 \quad \text{Requires : S, 18.34 per cent.}
\]
1-(p-METHYL-PHENYL)-3-(B-NAPHTHENESULFONYL)-THIOUREA:

It was prepared from B-Naphthalenesulfonamide and p-methylphenylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 263-4°C.

Found: S, 18.0 per cent.

C_{18}H_{16}S_{2}O_{2}N_{2} Requires: S, 17.98 per cent.

1-(p-METHOXY-PHENYL)-3-(B-NAPHTHENESULFONYL)-THIOUREA:

It was prepared from B-naphthalenesulfonamide and p-methoxyphenylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 152-3°C.

Found: S, 17.3 per cent.

C_{18}H_{16}S_{2}O_{2}N_{2} Requires: S, 17.2 per cent.

1-(p-CHLORO-PHENYL)-3-(B-NAPHTHENESULFONYL)-THIOUREA:

It was prepared from B-naphthalenesulfonamide and p-chlorophenylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 164°C.

Found: S, 17.1 per cent.

C_{17}H_{13}S_{2}O_{2}N_{2}Cl Requires: S, 17.0 per cent.
1-(P-BROMO-PHENYL)-3-(B-NAPHTHALENESULFONYL)-THIOUREA:

It was prepared from B-naphthalenesulfonamide and p-bromophenylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 197-8° C.

Found: S, 15.3 per cent.

C_{17}H_{13}S_{2}O_{2}N_{2}Br

Requires: S, 15.2 per cent.

1-(O-METHYL-PHENYL)-3-(BENZYSULFONYL)-THIOUREA:

It was prepared from benzylsulfonamide and o-methylphenylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 170-1° C.

Found: S, 20.1 per cent.

C_{15}H_{16}S_{2}O_{2}N_{2}

Requires: S, 20.0 per cent.

1-(P-METHOXY-PHENYL)-3-(BENZYSULFONYL)-THIOUREA:

It was prepared from benzylsulfonamide and p-methoxyphenylisothiocyanate by the procedure described before. It crystallised from 70% methyl alcohol m.p. 165-6° C.

Found: S, 19.1 per cent.

C_{15}H_{16}S_{2}O_{2}N_{2}

Requires: S, 19.05 per cent.
1-(3:5-DIMETHYL-PHENYL)-3-(BENZYL SULFONYL)-THIOUREA:

It was prepared from benzylsulfonamide and 3:5-dimethyl phenylisothiocyanate by the procedure described before. It crystallised from 70 % methyl alcohol m.p. 181-2°C.

\[ \text{Found: S, 19.2 per cent.} \]
\[ \text{C}_{16}\text{H}_{18}\text{S}_{2}\text{O}_{2}\text{N}_{2} \]
\[ \text{Requires: S, 19.16 per cent.} \]

1-(2:4-DIMETHYL-BENZYL)-3-(BENZYL SULFONYL)-THIOUREA:

It was prepared from benzylsulfonamide and 2:4-dimethyl benzylisothiocyanate by the procedure described before. It crystallised from 70 % methyl alcohol m.p. 121-2°C.

\[ \text{Found: S, 18.5 per cent.} \]
\[ \text{C}_{17}\text{H}_{20}\text{S}_{2}\text{O}_{2}\text{N}_{2} \]
\[ \text{Requires: S, 18.4 per cent.} \]
DESULFORIZATION OF SULFONYL THIOUREAS TO GET CORRESPONDING SULFONYL UREAS:

These were prepared as shown below in the case of 1-butyl-3-p-methylphenylsulfonyl urea.

\[ \text{P-MeC}_6\text{H}_4\text{SO}_{2}\text{NHCS NHBU (2.5 g.) in water (20 ml.) and NaOH (1.1 g.) was treated dropwise with H}_2\text{O}_2 30\% (3.7 g.) in water (20 ml.) at 20-30^\circ C. Allowed to remain one hour at room temperature. Finally the solution was acidified with HCl and the product filtered gave 2.2 g (73\%) of the corresponding urea derivative viz. 1-butyl-3-p-methylphenylsulphonyl urea.} \]


The following table shows 1-(substituted-aryl)-3- (substituted-arylsulfonyl) ureas obtained by the desulfurization of corresponding sulfonylthioureas. The sulfonylureas were crystallised from 70\% methyl alcohol.
<table>
<thead>
<tr>
<th>No.</th>
<th>R'</th>
<th>R=</th>
<th>FORMULA</th>
<th>Mf°C</th>
<th>% of S Calculated</th>
<th>Found</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>C₆H₅</td>
<td>P-CH₃-C₆H₄</td>
<td>C₁₄H₁₄SO₃N₂</td>
<td>167-8</td>
<td>11.0</td>
<td>11.1</td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td>0-CH₂O-C₆H₄</td>
<td>C₁₄H₁₄SO₃N₂</td>
<td>173-4</td>
<td>10.4</td>
<td>10.5</td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td>3:5-(CH₃)₂C₆H₃</td>
<td>C₁₅H₁₆SO₃N₂</td>
<td>200</td>
<td>10.5</td>
<td>10.6</td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td>0-CH₂C₆H₄.CH₂</td>
<td>C₁₅H₁₆SO₃N₂</td>
<td>160</td>
<td>10.5</td>
<td>10.4</td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td>m-CH₃C₆H₄.CH₂</td>
<td>-do-</td>
<td>138.9</td>
<td>10.5</td>
<td>10.4</td>
</tr>
<tr>
<td>6.</td>
<td></td>
<td>p-CH₃C₆H₄.CH₂</td>
<td>-do-</td>
<td>166.7</td>
<td>10.5</td>
<td>10.4</td>
</tr>
<tr>
<td>7.</td>
<td></td>
<td>2:4-(CH₃)₂C₆H₃.CH₂</td>
<td>C₁₆H₁₈SO₃N₂</td>
<td>154.5</td>
<td>10.0</td>
<td>10.1</td>
</tr>
<tr>
<td>8.</td>
<td></td>
<td>2:5-(CH₃)₂C₆H₃.CH₂</td>
<td>-do-</td>
<td>160.1</td>
<td>10.0</td>
<td>10.1</td>
</tr>
<tr>
<td>9.</td>
<td></td>
<td>3:4-(CH₃)₂C₆H₃.CH₂</td>
<td>-do-</td>
<td>171.2</td>
<td>10.0</td>
<td>9.9</td>
</tr>
<tr>
<td>10.</td>
<td></td>
<td>O-Cl.C₆H₄.CH₂</td>
<td>C₁₄H₁₅SO₃N₂Cl</td>
<td>145.6</td>
<td>9.86</td>
<td>9.9</td>
</tr>
<tr>
<td>11.</td>
<td></td>
<td>p-Cl.C₆H₄.CH₂</td>
<td>-do-</td>
<td>180</td>
<td>9.86</td>
<td>9.9</td>
</tr>
<tr>
<td>12.</td>
<td></td>
<td>o-CH₃C₆H₄</td>
<td>C₁₅H₁₆SO₃N₂</td>
<td>182-3</td>
<td>10.5</td>
<td>10.6</td>
</tr>
<tr>
<td></td>
<td>13. P-CH$_2$C$_6$H$_4$</td>
<td>m-CH$_3$C$_6$H$_4$</td>
<td>C$<em>{15}$H$</em>{16}$SO$_3$N$_2$</td>
<td>180.1</td>
<td>10.5</td>
<td>10.6</td>
</tr>
<tr>
<td>---</td>
<td>----------------------</td>
<td>-------------------</td>
<td>-----------------------------</td>
<td>-------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>14.</td>
<td>&quot;</td>
<td>p-CH$_3$C$_6$H$_4$</td>
<td>-do-</td>
<td>154.5</td>
<td>10.5</td>
<td>10.6</td>
</tr>
<tr>
<td>15.</td>
<td>&quot;</td>
<td>o-CH$_3$O.C$_6$H$_4$</td>
<td>C$<em>{15}$H$</em>{16}$SO$_4$N$_2$</td>
<td>190.1</td>
<td>10.0</td>
<td>10.1</td>
</tr>
<tr>
<td>16.</td>
<td>&quot;</td>
<td>p-CH$_3$O.C$_6$H$_4$</td>
<td>-do-</td>
<td>157.8</td>
<td>10.0</td>
<td>10.0</td>
</tr>
<tr>
<td>17.</td>
<td>&quot;</td>
<td>p-Cl.C$_6$H$_4$</td>
<td>C$<em>{14}$H$</em>{13}$SO$_3$N$_2$Cl</td>
<td>168.9</td>
<td>9.86</td>
<td>9.8</td>
</tr>
<tr>
<td>18.</td>
<td>&quot;</td>
<td>p-Br.C$_6$H$_4$</td>
<td>C$<em>{14}$H$</em>{13}$SO$_3$N$_2$Br</td>
<td>245.7</td>
<td>8.67</td>
<td>8.7</td>
</tr>
<tr>
<td>19.</td>
<td>&quot;</td>
<td>3:5-(CH$_3$)$_2$.C$_6$H$_3$</td>
<td>C$<em>{16}$H$</em>{18}$SO$_3$N$_2$</td>
<td>150.1</td>
<td>10.0</td>
<td>10.0</td>
</tr>
<tr>
<td>20.</td>
<td>&quot;</td>
<td>o-CH$_3$.C$_6$H$_4$.CH$_2$</td>
<td>C$<em>{16}$H$</em>{18}$SO$_3$N$_2$</td>
<td>166.7</td>
<td>10.0</td>
<td>10.0</td>
</tr>
<tr>
<td>21.</td>
<td>&quot;</td>
<td>m-CH$_3$.C$_6$H$_4$.CH$_2$</td>
<td>-do-</td>
<td>128.9</td>
<td>10.0</td>
<td>10.0</td>
</tr>
<tr>
<td>22.</td>
<td>&quot;</td>
<td>p-CH$_3$.C$_6$H$_4$.CH$_2$</td>
<td>-do-</td>
<td>198.9</td>
<td>10.0</td>
<td>10.1</td>
</tr>
<tr>
<td>23.</td>
<td>&quot;</td>
<td>2:4-(CH$_3$)$_2$.C$_6$H$_3$.CH$_2$</td>
<td>C$<em>{17}$H$</em>{20}$SO$_3$N$_2$</td>
<td>157.8</td>
<td>9.6</td>
<td>9.7</td>
</tr>
<tr>
<td>26.</td>
<td>&quot;</td>
<td>o-Cl.C$_6$H$_4$.CH$_2$</td>
<td>C$<em>{15}$H$</em>{15}$SO$_3$N$_2$Cl</td>
<td>157</td>
<td>9.45</td>
<td>9.5</td>
</tr>
<tr>
<td>27.</td>
<td>&quot;</td>
<td>p-Cl.C$_6$H$_4$.CH$_2$</td>
<td>-do-</td>
<td>206.7</td>
<td>9.45</td>
<td>9.5</td>
</tr>
<tr>
<td>28.</td>
<td>&quot;</td>
<td>p-Br.C$_6$H$_4$.CH$_2$</td>
<td>C$<em>{15}$H$</em>{15}$SO$_3$N$_2$Br</td>
<td>181.2</td>
<td>8.35</td>
<td>8.4</td>
</tr>
<tr>
<td>29.</td>
<td>&quot;</td>
<td>p-CH$_2$.O.C$_6$H$_4$</td>
<td>o-CH$_3$.C$_6$H$_4$</td>
<td>C$<em>{15}$H$</em>{16}$SO$_4$N$_2$</td>
<td>143.4</td>
<td>10.0</td>
</tr>
<tr>
<td>30.</td>
<td>&quot;</td>
<td>m-CH$_3$.C$_6$H$_4$</td>
<td>-do-</td>
<td>175.6</td>
<td>10.0</td>
<td>10.1</td>
</tr>
<tr>
<td>No.</td>
<td>Name</td>
<td>Formula</td>
<td>Molecular Weight</td>
<td>Molecular Mass</td>
<td>Ref.</td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>------</td>
<td>---------</td>
<td>------------------</td>
<td>---------------</td>
<td>------</td>
<td></td>
</tr>
<tr>
<td>31.</td>
<td>p-CH$_2$O.C$_6$H$_4$</td>
<td>o-CH$_2$O.C$_6$H$_4$</td>
<td>C$<em>{15}$H$</em>{16}$SO$_2$N$_2$</td>
<td>123.4</td>
<td>9.5 9.6</td>
<td></td>
</tr>
<tr>
<td>32.</td>
<td>&quot;</td>
<td>p-CH$_2$O.C$_6$H$_4$</td>
<td>-do-</td>
<td>154.5</td>
<td>9.5 9.5</td>
<td></td>
</tr>
<tr>
<td>33.</td>
<td>&quot;</td>
<td>3:5-(CH$_3$)$_2$C$_6$H$_3$</td>
<td>C$<em>{16}$H$</em>{18}$SO$_4$N$_2$</td>
<td>174.5</td>
<td>9.5 9.8</td>
<td></td>
</tr>
<tr>
<td>34.</td>
<td>&quot;</td>
<td>o-CH$_3$.C$_6$H$_4$.CH$_2$</td>
<td>C$<em>{16}$H$</em>{18}$SO$_4$N$_2$</td>
<td>180.1</td>
<td>9.5 9.6</td>
<td></td>
</tr>
<tr>
<td>35.</td>
<td>&quot;</td>
<td>m-CH$_3$.C$_6$H$_4$.CH$_2$</td>
<td>-do-</td>
<td>139.40</td>
<td>9.5 9.5</td>
<td></td>
</tr>
<tr>
<td>37.</td>
<td>&quot;</td>
<td>2:4-(CH$_3$)$_2$C$_6$H$_3$.CH$_2$</td>
<td>C$<em>{17}$H$</em>{20}$SO$_4$N$_2$</td>
<td>183.4</td>
<td>9.1 9.2</td>
<td></td>
</tr>
<tr>
<td>38.</td>
<td>&quot;</td>
<td>2:5-(CH$_3$)$_2$C$_6$H$_3$.CH$_2$</td>
<td>-do-</td>
<td>183.4</td>
<td>9.1 9.2</td>
<td></td>
</tr>
<tr>
<td>39.</td>
<td>&quot;</td>
<td>3:4-(CH$_3$)$_2$C$_6$H$_3$.CH$_2$</td>
<td>-do-</td>
<td>156.7</td>
<td>9.1 9.1</td>
<td></td>
</tr>
<tr>
<td>40.</td>
<td>&quot;</td>
<td>o-Cl.C$_6$H$_4$.CH$_2$</td>
<td>C$<em>{15}$H$</em>{15}$SO$_4$N$_2$Cl</td>
<td>154.5</td>
<td>9.0 9.0</td>
<td></td>
</tr>
<tr>
<td>41.</td>
<td>&quot;</td>
<td>p-Cl.C$_6$H$_4$.CH$_2$</td>
<td>-do-</td>
<td>213.4</td>
<td>9.0 9.0</td>
<td></td>
</tr>
<tr>
<td>42.</td>
<td>&quot;</td>
<td>p-Br.C$_6$H$_4$.CH$_2$</td>
<td>C$<em>{15}$H$</em>{15}$SO$_4$N$_2$Br</td>
<td>212.3</td>
<td>8.0 8.1</td>
<td></td>
</tr>
<tr>
<td>43.</td>
<td>p-Cl.C$_6$H$_4$</td>
<td>o-CH$_3$.C$_6$H$_4$</td>
<td>C$<em>{14}$H$</em>{13}$SO$_3$N$_2$Cl</td>
<td>155.6</td>
<td>9.86 9.9</td>
<td></td>
</tr>
<tr>
<td>44.</td>
<td>&quot;</td>
<td>o-CH$_2$O.C$_6$H$_4$</td>
<td>C$<em>{14}$H$</em>{13}$SO$_3$N$_2$Cl</td>
<td>174.5</td>
<td>9.39 9.4</td>
<td></td>
</tr>
<tr>
<td>45.</td>
<td>&quot;</td>
<td>p-CH$_2$O.C$_6$H$_4$</td>
<td>-do-</td>
<td>174</td>
<td>9.39 9.3</td>
<td></td>
</tr>
<tr>
<td>46.</td>
<td>&quot;</td>
<td>p-Cl.C$_6$H$_4$</td>
<td>C$<em>{13}$H$</em>{10}$SO$_3$N$_2$Cl</td>
<td>178.9</td>
<td>9.27 9.2</td>
<td></td>
</tr>
<tr>
<td>47.</td>
<td>&quot;</td>
<td>o-CH$_3$.C$_6$H$_4$.CH$_2$</td>
<td>C$<em>{15}$H$</em>{15}$SO$_3$N$_2$Cl</td>
<td>167.8</td>
<td>9.45 9.6</td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Compound</td>
<td>Molecular Formula</td>
<td>MP (°C)</td>
<td>Boiling Point (°C)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>-------------------------------</td>
<td>----------------------</td>
<td>---------</td>
<td>--------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>49.</td>
<td>p-Cl.C₆H₄ p-CH₃.C₆H₄.CH₂</td>
<td>C₁₅H₁₅SO₃N₂Cl</td>
<td>214.5</td>
<td>9.45 9.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50.</td>
<td>&quot;</td>
<td>C₁₆H₁₇SO₃N₂Cl</td>
<td>169.70</td>
<td>9.07 9.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>52.</td>
<td>&quot;</td>
<td>-do-</td>
<td>158.9</td>
<td>9.07 9.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>53.</td>
<td>&quot;</td>
<td>C₁₄H₁₂SO₃N₂Cl</td>
<td>157.8</td>
<td>8.9 9.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>54.</td>
<td>&quot;</td>
<td>-do-</td>
<td>205.6</td>
<td>8.9 9.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>55.</td>
<td>&quot;</td>
<td>C₁₄H₁₂SO₃N₂ClBr</td>
<td>164.5</td>
<td>7.9 8.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>56.</td>
<td>p-Br.C₆H₄ o-CH₃.C₆H₄</td>
<td>C₁₄H₁₃SN₂O₃Br</td>
<td>251.2</td>
<td>8.67 8.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>57.</td>
<td>&quot;</td>
<td>-do-</td>
<td>196.7</td>
<td>8.67 8.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>58.</td>
<td>&quot;</td>
<td>C₁₄H₁₃SN₂O₄Br</td>
<td>167</td>
<td>8.3 8.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>59.</td>
<td>&quot;</td>
<td>-do-</td>
<td>182.3</td>
<td>8.3 8.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60.</td>
<td>&quot;</td>
<td>C₁₅H₁₄O₂SO₃N₂BrCl</td>
<td>190.1</td>
<td>8.2 8.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>61.</td>
<td>&quot;</td>
<td>C₁₅H₁₀O₂SO₃N₂Br₂</td>
<td>256.7</td>
<td>7.4 7.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>62.</td>
<td>&quot;</td>
<td>C₁₅H₁₅SN₂O₃Br</td>
<td>166.7</td>
<td>8.35 8.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>63.</td>
<td>&quot;</td>
<td>-do-</td>
<td>177.8</td>
<td>8.35 8.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>64.</td>
<td>&quot;</td>
<td>-do-</td>
<td>158.9</td>
<td>8.35 8.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>65.</td>
<td>&quot;</td>
<td>-do-</td>
<td>210.1</td>
<td>8.35 8.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>66.</td>
<td>&quot;</td>
<td>C₁₆H₁₇SN₂O₃Br</td>
<td>166.7</td>
<td>8.06 8.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Compound</td>
<td>Molecular Formula</td>
<td>Molar Mass</td>
<td>Density (g/cm³)</td>
<td>Solubility (g/L)</td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>----------</td>
<td>-------------------</td>
<td>-------------</td>
<td>-----------------</td>
<td>-----------------</td>
<td></td>
</tr>
<tr>
<td>67.</td>
<td>p-BrC₆H₄</td>
<td>2:5-(CH₃)₂C₆H₃·CH₂</td>
<td>C₁₆H₁₇SN₂O₂Br</td>
<td>201.2</td>
<td>8.06</td>
<td></td>
</tr>
<tr>
<td>68.</td>
<td>&quot;</td>
<td>3:4-(CH₃)₂C₆H₅·CH₂</td>
<td>-do-</td>
<td>183.4</td>
<td>8.06</td>
<td></td>
</tr>
<tr>
<td>69.</td>
<td>&quot;</td>
<td>o-ClC₆H₄·CH₂</td>
<td>C₁₄H₁₂SN₂O₂Br</td>
<td>170.1</td>
<td>10.5</td>
<td></td>
</tr>
<tr>
<td>70.</td>
<td>&quot;</td>
<td>p-ClC₆H₄·CH₂</td>
<td>-do-</td>
<td>205.6</td>
<td>10.5</td>
<td></td>
</tr>
<tr>
<td>71.</td>
<td>&quot;</td>
<td>p-BrC₆H₄·CH₂</td>
<td>C₁₄H₁₂SN₂O₂Br</td>
<td>181.2</td>
<td>7.14</td>
<td></td>
</tr>
<tr>
<td>72.</td>
<td>p-NH₂C₆H₄</td>
<td>o-CH₃O·C₆H₄</td>
<td>C₁₄H₁₅O₄N₂S</td>
<td>90.1</td>
<td>9.96</td>
<td></td>
</tr>
<tr>
<td>73.</td>
<td>&quot;</td>
<td>2:4-(CH₃)₂C₆H₅·CH₂</td>
<td>C₁₆H₁₉O₃N₂S</td>
<td>148.9</td>
<td>9.6</td>
<td></td>
</tr>
<tr>
<td>74.</td>
<td>C₆H₅·CH₂</td>
<td>o-CH₃·C₆H₄</td>
<td>C₁₅H₁₆SO₄N₂</td>
<td>176.7</td>
<td>10.5</td>
<td></td>
</tr>
<tr>
<td>75.</td>
<td>&quot;</td>
<td>p-CH₃O·C₆H₄</td>
<td>C₁₅H₁₆SO₄N₂</td>
<td>189.90</td>
<td>10.9</td>
<td></td>
</tr>
<tr>
<td>76.</td>
<td>&quot;</td>
<td>2:4(CH₃)₂C₆H₃·CH₂</td>
<td>C₁₇H₂₀SO₃N₂</td>
<td>190.1</td>
<td>9.6</td>
<td></td>
</tr>
</tbody>
</table>