clearly that the effect of ionization upon
the monolayer properties is connected with
their hydrophobic character. It is also
evident that the strength of the hydro-
phobic properties largely determines the
nature of the effect. Differences similar to
those noted for the rosin acids may also
be found among other groups of substances
in which the hydrophobic properties
undergo similar variations.

I am indebted to Professor Per Ekwall, the
Head of the Institute, for discussions.

   Received May 13, 1952.

Thiohydrazides and Thiohydrazo-
nes: A New Class of Antibacterial
Substances

KAI ARNE JENSEN and CARL LUND JENSEN

Research Laboratory of A/S Ferrosan,
Copenhagen, Denmark

In 1934 Jensen¹ prepared several co-
ordination compounds of thiosemicar-
bazide and substituted thiosemicarbazides.
Recently Jensen and Miquel² found that
thiobenzhydrazide, C₆H₅CSNHN₂₃, forms
nickel complexes of the same type as are
formed by the thiosemicarbazides. A close
parallel appears to exist between tuber-
culostatic activity of the thiosemicarba-
zones and their ability to form co-ordina-
tion compounds with copper³. Since the
complex compounds of thiosemicarbazides
and thiohydrazides are similar we should
expect that thiohydrazones would also
possess antibacterial activity. A large
number of thiohydrazides and thiohydra-
zones were therefore prepared and tested.
Preliminary experiments showed that both
classes of compounds were antibacterial
as well as fungistic, so we are now making
a more detailed investigation of their
activity.

The thiohydrazides were prepared by
reaction of esters of dithioacids or the free
dithioacids with hydrazine. The following
new thiohydrazides were prepared:

_Thiophenylacethyldrazide._ M.p. 71°.
C₅H₉N₂S (166.2)
Calc. C 57.82 H 6.07 N 16.86 S 19.26
Found » 57.52 » 5.95 » 16.96 » 19.25

_2-Hydroxythiobenzhydrazide._ M.p. 102°.
C₇H₆ON₂S (168.2)
Calc. C 50.00 H 4.80 N 16.66 S 19.07
Found » 49.98 » 4.85 » 16.95 » 18.92

_4-Hydroxythiobenzhydrazide._ M.p. 208°.
C₇H₆ON₂S (168.2)
Calc. C 50.00 H 4.80 N 16.66
Found » 50.25 » 4.73 » 16.83

_4-Methoxythiobenzhydrazide._ M.p. 126°.
C₉H₁₀ON₂S (182.2)
Calc. C 52.72 H 5.53 N 15.38 S 17.59
Found » 52.85 » 5.48 » 15.31 » 17.30

_3-Methoxy-4-hydroxythiobenzhydrazide._
M.p. 148°.
C₉H₁₀O₂N₂S (198.2)
Calc. C 48.48 H 5.09 N 14.14
Found » 48.68 » 5.18 » 14.06

_4-Acetamidothiobenzhydrazide._ M.p. 234°.
C₉H₁₁ON₂S (209.3)
Calc. C 51.67 H 5.30 N 20.09
Found » 51.71 » 5.38 » 20.41

_4-Dimethylaminothiobenzhydrazide._
M.p. 170°.
C₉H₁₂N₂S (195.3)
Calc. C 55.37 H 6.71 N 21.53
Found » 55.31 » 6.75 » 21.50

_2-Furanethiocarboxyhydrazide._ M.p. 135°.
C₅H₆ON₂S (142.2)
Calc. C 42.25 H 4.26 N 19.71 S 22.52
Found » 42.28 » 4.44 » 19.92 » 22.45
SHORT COMMUNICATIONS

2-Thiophenethiocarboxyhydrazide. M.p. 156°.

C₈H₇N₃S₂ (158.2)
Calc. C 37.98 H 3.83 N 17.72 S 40.53
Found 38.11 3.58 17.83 40.42

2-Pyrroloethiocarboxyhydrazide. M.p. 122°.

C₈H₇N₃S (141.2)
Calc. C 42.55 H 5.00 N 29.78 S 22.67
Found 42.66 5.29 29.82 22.66


C₈H₇N₃S (191.2)
Calc. C 56.54 H 4.75 N 21.98 S 16.77
Found 56.97 5.02 22.16 16.85

Further details will be given in a subsequent paper in this journal.


Received June 13, 1952.

On the Atomic Composition of the Mineral Belyankite

A. H. NIELSEN

Chemical Laboratory, "Kryolitselskabet Øresund AS", Copenhagen, Denmark

The Russian mineralogist Dorfman has recently published a paper ¹ on a new fluorine mineral, belyankite, from Central Kazakhstan. Amongst other things Dorfman has determined some optic constants, thermic data, and the specific weight (2.720) for this mineral. Further Dorfman gives x-ray data (S. S. Kvitka) and a chemical analysis (M. O. Stepman), giving the following weight percentages:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Al₂O₃</td>
<td>21.88</td>
</tr>
<tr>
<td>CaO</td>
<td>34.00</td>
</tr>
<tr>
<td>P</td>
<td>49.01</td>
</tr>
<tr>
<td>H₂O⁺</td>
<td>15.35</td>
</tr>
<tr>
<td>H₂O⁻</td>
<td>0.30</td>
</tr>
<tr>
<td></td>
<td>120.54</td>
</tr>
</tbody>
</table>

On the basis of this analysis Dorfman assigns the following formula to belyankite:

Ca₉Al₂(F, OH)₁₃ · [H₂O].

If the analysis is recalculated according to the method usually employed for double fluorides (discounting H₂O⁻, as Dorfman himself does), we get:

Ca₈Al₂(F, OH)₁₃ · [H₂O].