

hold some promise of useful analytical application in the separation and identification of members of the group of highly insoluble compounds. The writer hopes to have the privilege of publishing a more detailed account of these reactions at some future date.

DEPARTMENT OF CHEMISTRY
PRINCETON UNIVERSITY
PRINCETON, NEW JERSEY
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EARLE R. CALEY

GERMICIDAL ACTIVITY OF ALKYL SULFUR ETHERS

Sir:

A problem interesting various investigators during recent years in the field of antiseptics has been the effect on the activity of phenol germicides of variations in substituting groups. Johnson and Lane [THIS JOURNAL, **43**, 348 (1921)], and Dohme, Cox and Miller [*ibid.*, **48**, 1688 (1926)] pointed out that alkyl resorcinols become progressively more active as the length of an alkyl side chain increases. Hilbert and Johnson [THIS JOURNAL, **51**, 1534 (1929)] showed that the activity of the three hydroxy diphenyl sulfides increased in the order: ortho, meta, para. The authors [*ibid.*, **54**, 1195 (1932)] discussed the effect of alkyl chains substituted into the phenol nucleus, stating that position isomerism is of slight importance but that variations in the chain are of greatest importance.

It seemed of interest to compare certain sulfur containing phenols with those previously studied. Methyl, ethyl, *n*-propyl, *n*-butyl, *n*-amyl, *n*-hexyl, isopropyl, isobutyl, isoamyl and benzyl thio ethers of phenol of the general formula RSC_6H_4OH have been prepared.

As in the case of the alkylresorcinols, alkyl phenols and alkyl ethers of hydroquinone [Ref. 4 and Klarmann, Gatyas and Shternov, THIS JOURNAL, **54**, 298 (1932)], the germicidal activity of these alkyl sulfur ethers increases with increase in the size of the alkyl group. They show, however, a higher activity for a given alkyl group and reach the maximum with the amyl derivative. An increase in the temperature at which the bacteriological examination is made raises this maximum to higher members of the series. The iso-alkyl ethers have lower phenol coefficients than the corresponding normal alkyl derivatives.

The O-ethers of thiophenol are probably much less active than the corresponding S-ethers of phenol.

A complete report of this work will be published in the near future.

CHEMICAL LABORATORIES
SHARP AND DOHME
PHILADELPHIA, PA.
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ELLIS MILLER
R. R. READ