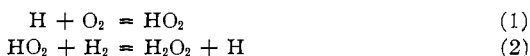


in this Laboratory, using a Bausch and Lomb monochromator and receiving the transmitted energy on a thermopile. The transmissions measured are given in the accompanying table.

Wave length in Å.	Fraction of incident light transmitted	Wave length in Å.	Fraction of incident light transmitted
2475	0.24	3650	0.00
2536	.31	4047	.00
2650	.36	4350	.03
2804	.17	4916	.25
2967	.00	5461	.60
3024	.00	5770	.53

These results agree fairly well with measurements on a similar filter reported by Villars [THIS JOURNAL, 48, 1874 (1926)]. As a result of these measurements the quantum yield reported by the author will have to be reduced from 6.6 to 2.5.

In previous experiments (Ref. 1) using a closed circulatory system the author was able to show that the product of the reaction was predominantly hydrogen peroxide. Due to an unfortunate accident, this was only an estimate, but a careful check on the volume of the system made from a photograph shows that the yield was at least 75% H₂O₂ and probably much greater. It is thus possible to say that in these experiments where the gas was saturated with water vapor at 20° the yield of water vapor in the reaction is not at all in agreement with the results of Frankenburger, who found more water formed than peroxide. His objection to the mechanism postulated



on account of the endothermic nature of reaction (2) is not necessarily valid since the original product HO₂ may react with oxygen before it loses the 69 k. cal. acquired in its formation.

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DERIVATIVES OF DIOXANE

Sir:

The recent article of C. L. Butler and L. H. Cretcher [THIS JOURNAL, 54, 2987 (1932)] and the communication of R. K. Summerbell and R. Christ [*ibid.*, 54, 3777 (1932)], both connecting with our first article [Böeseken, Tellegen and Henriquez, *Rec. trav. chim.*, 50, 909 (1931) and *Proc. R. Acad.*, 34, 631 (1931)] cause us to give a brief preliminary report of the continuation of our research. While chlorinating 2,3-dichlorodioxane, we obtained

the liquid asymmetrical tetrachlorodioxane, described by Butler and Cretcher, a crystalline hexachlorodioxane and more highly chlorinated derivatives which are under investigation. More properties of the isomeric naphthodioxanes have been determined and the inquiry has been enlarged to include the derivatives with 1,3-propanediol, pyrocatechol, benzyl alcohol, ester of tartaric acid, etc. By treatment with potassium acetate we made and investigated the diacetate. We are very much astonished that our first communication, intended *inter alia* to save double work, has apparently been understood as an invitation to continue our research. After this explanation we think it will be clear that we ourselves will continue our research in all directions. The results obtained since our last article will be communicated in the near future.

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J. BÖESEKEN
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THE REACTION OF CARBOXYLIC ACIDS WITH PHOSPHORUS PENTOXIDE

Sir:

Certain aliphatic ketones have been made by the action of phosphorus pentoxide with acids [Gal and Étard, *Compt. rend.*, **82**, 457 (1876); Kipping, *J. Chem. Soc.*, **57**, 532, 980 (1890); **63**, 452 (1893)]. An attempt to apply this reaction to trimethylacetic acid gave no ketone nor carbon dioxide but instead gave carbon monoxide and polymers of isobutylene. *n*-Butyric and isobutyric acids with excess of phosphorus pentoxide gave both carbon dioxide and carbon monoxide and formed tars. The yields and ratios of these gases were determined.

Acid	% Yield of CO and CO ₂	Ratio CO : CO ₂
<i>n</i> -Butyric	7	1:5
Isobutyric	10	5:1
Trimethylacetic	60	∞

Use of xylene as a solvent for the first two acids cut the yields of gas to 0.07 and 0.14%, respectively, but did not change the ratio of CO:CO₂. No gas was evolved when benzoic acid was treated in boiling xylene with an excess of phosphorus pentoxide.

This process is being studied as a possible means of distinguishing tertiary aliphatic acids from other types of acids.

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