

## THE MECHANISM OF SACCHARINIC ACID FORMATION

Sir:

An examination of the action of alkali on  $\alpha$ -hydroxy- $\beta$ -methoxy- $\beta$ -phenylpropiophenone,  $C_6H_5CH(OCH_3)CH(OH)COC_6H_5$ , would seem to offer a definite means for testing Nef's final theory of saccharinic acid formation [Nef, *Ann.*, **375**, 3 (1910)]. This substance may be regarded as a monomethyl ether of a diphenyltriose. When boiled with alkali it is converted, through a benzilic acid rearrangement of the diketone first formed, to  $\alpha,\beta$ -diphenyllactic acid. The yield of the latter is good.

A more detailed consideration of this reaction than can be given here, makes it clear that such a result definitely requires the separation of oxygen from carbon to occur at the  $\beta$ -carbon atom, since the elimination of the  $\alpha$ -hydroxyl group could not reasonably lead to the product obtained. The initial reaction is considered to be of the type of an "aldol dehydration," and its occurrence seems to require the revision of Nef's interpretation of the mechanism by which sugars form saccharinic acids, and perhaps also of the mechanism he advanced to explain the splitting of sugars by alkali.

A discussion of the first of these points will be submitted in the near future.

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ACTIVATED AND VAN DER WAALS ADSORPTION OF AMMONIA AND OF CERTAIN OTHER GASES

Sir:

Professor H. S. Taylor has presented [*Chem. Rev.*, **9**, 1 (1931); THIS JOURNAL, **53**, 578, 3604 (1931)] evidence for two types of adsorption of hydrogen, carbon monoxide, oxygen, nitrogen, water vapor and sulfur dioxide by solids. Van der Waals adsorption proceeds rapidly at low temperatures with small heat and small energy of activation. Catalytically active gas is adsorbed with much larger heat and activation energy, and the rate of adsorption may be relatively slow.

That an adsorbed gas may be bound in more than one way is well known. Thus water is held as hydronium ion ( $OH_3^+$ ) in perchloric acid monohydrate, as  $H_2O$  molecules in gypsum, as hydroxide ion in diaspore ( $AlOOH$ ) and in  $Mg(OH)_2$ , and as very loosely held  $H_2O$  in zeolites [van Arkel and Fritzius, *Rec. Trav. Chim.*, **50**, 1035 (1921)]. Infra-red absorption spectra show indications of two types of binding occurring in certain cases.