

was formed by many successive adsorptions and elutions of a racemic compound on optically asymmetric surfaces of minerals.

Experiments are in progress with the object of extending the research to other substances; the details of which will be published elsewhere.

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WE are greatly interested to read of the success obtained by Prof. Karagunis and G. Coumoulos in effecting a partial resolution of a complex chromium salt by the use of active quartz. Following up the work of Tsuchida, Kobayashi and Nakamura<sup>1</sup> upon the detection of a racemic inorganic complex by immersing powdered active quartz in its solution, we have also been examining the possibility of extending these results by the use of quartz columns in conjunction with inorganic as well as organic complexes.

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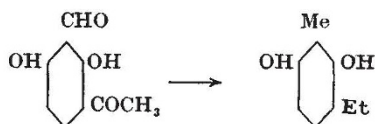
<sup>1</sup> *Chem. Soc. Japan*, 56, 1339 (1935).

#### Modified Gattermann Reaction: Synthesis of Hydroxy-Formyl-Phenyl-Ketones

ONE of the authors (R. C. S.) with Laiwalla has previously shown that methyl  $\beta$ -resorsylate does not undergo the Gattermann reaction under the usual conditions, that is, in the presence of zinc chloride in ether or in the presence of aluminium chloride in benzene; the reaction takes place readily, however, in the presence of anhydrous aluminium chloride dissolved in dry ether, with the formation of the aldehyde ester, methyl 2:4 dihydroxy-3-formyl benzoate<sup>1</sup>.

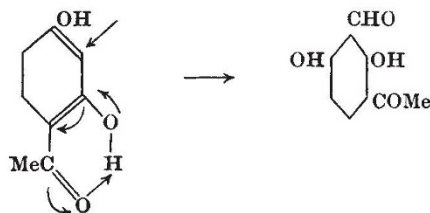
We now find that polyhydroxy-phenolic ketones also give aldehydes in high yields under the condition of Shah and Laiwalla's modified Gattermann reaction<sup>1</sup>, the formyl group entering (when possible) the usually inaccessible Y-position in the resorcinol nucleus. Thus resacetophenone gives 2-4-dihydroxy-3-formyl acetophenone, the constitution of which is established by its reduction by the Clemmensen method to 4-ethyl-2-methyl resorcinol of Robinson and Shah<sup>2</sup>.

Orsacetophenone, 2-acetyl resorcinol, 2-4-dihydroxy benzophenone and phloracetophenone afford similarly 2-4-dihydroxy-6-methyl-3-formyl-acetophenone, 2-6-dihydroxy-5-formyl-acetophenone, 2-4-dihydroxy-3-formyl-benzophenone and 2-4-6-trihydroxy-3-formyl-acetophenone respectively.



The orientation of the aldehydes from resacetophenone, orsacetophenone and 2-4-dihydroxy-benzo-

phenone, in which the formyl group enters the 3-position instead of the usual 5-position, is of interest. These results are best explained on the view that the chelation between the hydroxyl and the acetyl group stabilizes the double bonds in the resorcinol nucleus; the carbon atom in the 3-position, which is united by a double bond to the carbon atom bearing the 4-hydroxyl group, is thus the point of attack (*cf.* W. Baker<sup>3</sup>).



The synthesis of such hydroxy-formyl-phenyl ketones opens up various possibilities for the synthesis of heterocyclic compounds containing oxygen in the ring-like coumarino-Y-pyrone, furo-chromones, etc., which are being explored.

A detailed account of the above investigation will shortly be submitted to the Chemical Society.

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<sup>1</sup> Shah and Laiwalla, *Current Science*, 197 (1936).

<sup>2</sup> Robinson and Shah, *J. Chem. Soc.*, 1494 (1934).

<sup>3</sup> Baker, W., *J. Chem. Soc.*, 1684 (1934).

#### Long-distance Radio Reception and the E-Region of the Ionosphere

MR. ALEXANDER A. MCKENZIE, of the Mount Washington Observatory, has reported a well-marked case of the long-distance reception of amateur 56-60 megacycle signals, which occurs occasionally at this time of year. A letter from him reads in part: "We started listening about 1930 E.S.T. (June 5, 1938) and listened continuously until about 2045. During the whole time, long-distance signals were fading in and out fairly rapidly with extremely audible volume at the start, for instance, of a call letter group and absolute silence before the group was completed."

Mr. McKenzie, on Mount Washington, heard twelve Middle Western stations, and reports a supplementary list of seven other stations which were being called by various amateur stations in the New England area. With two exceptions which may be ascribed to faulty identification, the stations heard in New England appear to have been closely grouped about a point somewhat south of Chicago. The minimum and maximum distances involved are 780 and 960 miles, the mean being 880 miles.

Continuous records of the heights of reflections from the ionosphere are made at Cruft Laboratory at a frequency of 3.5 megacycles. On the night in question, remarkably strong abnormal E region reflections were observed from 1912 to 2035 E.S.T., the number of multiple reflections varying from four to six. At 2035 the reflection began to decrease in intensity, and it disappeared completely at 2050. The apparent height of reflection was  $120 \pm 3$  km. throughout the period.