

May 25, 1943

Air Mail

~~CONFIDENTIAL~~

Dr. F. S. Bacon
 Arthur D. Little Co.
 30 Charles River Road
 Cambridge, Massachusetts

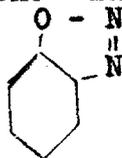
Dear Dr. Bacon:

Thank you very much for your letter of May 19th.

Your requests for 35 lb. of the fluoro-chelate is at the same time encouraging and frightening. If you will note in my report of last month, our rate of production of the aldehyde was given at about 1/2 lb. a day when everything is running smoothly which it hardly ever does. In any case we hope to have a sample shipped to Catterall by the end of this week.

With respect to the questions which you raised concerning our cycling tests, the answer is as follows: the absorption cooling water temperature of the water used was room temperature or approximately 18-20°C. The percentage absorption at this temperature and at 20 p.s.i. gauge in 3-1/2 minutes was between 85-90% while the 6 minute description at 100°C and 1/3 atmosphere pressure gave something of the order of 90% or somewhat better description.

With respect to the suggestions for another method of synthesizing the fluorophenol, it seems to me that the main difference between the process we are using and the one you are suggesting is that we diazotize *o*-aminophenol instead of *o*-anisidine. We have tried diazotizing *o*-aminophenol and we got very good yields of the diazo oxide.



We have tried to convert this diazo oxide into fluorophenol by treatment with HF of various concentrations and at various temperatures but without success. We have made no serious effort to precipitate from the diazotized aminophenol solutions a true diazonium borofluoride. It has been our experience and it can be found in the literature that the presence of a free

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hydroxyl group on an amine makes the diazonium salts relatively soluble and difficult to precipitate. In the case of the o-hydroxyl group, these diazo oxides are formed which apparently are not true diazonium salts at all and do not undergo the usual diazonium salt decompositions. If however you feel that a successful conversion of o-aminophenol into o-fluorophenol would have material advantages over the conversion of the corresponding anisole, we will give it another trial in an attempt to precipitate a borofluoride.

Since our problems in this synthesis are primarily engineering ones, I wonder if you would take up with Mr. Stevenson the possibility of finding for us or sending us one of your young chemical engineers to work with us for the next few months. I have discussed this with our boys here and they feel, as I do, that such help will be highly desirable.

Our forthcoming report for June 1st should have the detailed description of our cycling tests in it as well as some interesting observations as to the detailed mechanism of the whole reaction.

Please give my greetings to Mr. Stevenson and thanks for his prompt reply to my telegram earlier this week.

I hope we will be able to fulfill your requests in not too long a time.

Very truly yours

M. Calvin

mc/ner