

IMPERIAL COLLEGE OF SCIENCE AND TECHNOLOGY

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DEPARTMENT OF CHEMICAL ENGINEERING
AND APPLIED CHEMISTRY

PRINCE CONSORT ROAD
LONDON -- S.W.7

29th May 1947

Dear Prof Sir Krishnan,

May I hasten to offer my respectful congratulations on your appointment as the Director of our National Physical Laboratory. No one is better fitted to guide its destinies and I am really glad that the N.P.L. has got such an excellent start.

I am writing also in another connection, namely, my own selection as Assistant Director in the Optics section. I have a feeling that this valuable gift is from Prof Saha and your good self, for which I thank you most sincerely. My services are at your disposal for the cause of advancement of Physics in our country. Doubts however arise in my mind as whether taking charge of the Optics section would be the best way in which this object can be achieved. As I see, the topics to be dealt with under the Optics section will be standardisation of optical instruments and light sources, testing of lamps and binoculars etc, study of colour dyes and microphotometry. This is somewhat different from a subject in which I have been able to make some contribution - namely spectroscopy and combustion theory. With the generous help from the C.S.I.R. I have been able to expand my activities considerably. Now there are five of us tackling problems on different aspects of combustion. My own connection is through being the discoverer of HCO bands, which are of fundamental importance in the study of combustion, not only in the petrol aeroengines but also gas turbines (jet propulsion). One of my students at Bombay has been examining the spectra of alcohol flames which is one of the fuels used in rockets. The other topics being tackled under my guidance are (a) equi-partition of energy by determining vibrational temperatures from intensity measurements and temperatures by sodium line reversal method. Then I have been able to get a student in Paris to study the relationship between the intensity changes and temperature changes in the flames of methane and acetylene. Another student is examining intensity changes in discharge tubes. The workers are so widely spread, two are in Bombay, one in Dacca, one in Paris and myself in London.

Thus, I have an extensive programme of research on the study of combustion by spectroscopic methods. What I am doing here is of the highest importance because the results of this experiment will definitely determine whether the emitter is HCO. The approach is through the examination of the spectrum of the flame of deuterioacetylene and atomic oxygen; the apparatus for the production of atomic oxygen is as shown in fig 1 and is now in operation. At the moment I am busy with the preparation of heavy acetylene, which being a chemical undertaking is more complicated. From the isotopic shift CDO and CHO the emitter can be determined.

You are the best person to guide me as to what I should do. I have fortunately acquired some status in the field of spectroscopy and combustion theory and for the rest of my life it would be best to continue with it. Lf

INSTITUTE OF SCIENCE AND TECHNOLOGY

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Topical: Kishorepalli

If this research work can be fitted into my duties as being in charge of the Optics section, then it would not disturb the continuity of this research. I find that under Heat and Power section there are sections on power generation and in aero-engines and gas turbines and rockets-topics with which my own work is connected and it is therefore not impossible to fit in my research after accepting the post.

Another point is how soon I would be required to join. It would be a great pity if sufficient time were not given to complete successfully what I have in hand here. It will be sometime before the buildings of the N.P.L. are ready and the equipment arrives; then during this period what arrangements would be possible for the continuance of my research? All these questions arise in my mind and I shall be ever so thankful if you would be good enough to help in coming to a decision by giving your kind advice in this matter. The best service I can render to the cause of Physics in India is to develop this subject of combustion theory and spectroscopy still more since it is so intimately connected with the phenomenon of combustion in aeroengines, gas turbines and probably even rockets.

With respectful regards,

Yours sincerely

Wm Vaidya.