

S. Bhagavantam

Waltair
26th August.

30/8

My dear Krishnan,

I hope the news that I see in the papers that you are to take up the Directorship of the Indian Institute of Science has your approval. In a way I am glad that a premier scientific institution of South India will have the benefit of your guidance but I rather think that the National Physical Laboratory will miss you very much. Do write to me as soon as things take definite shape, if you can possibly do so.

I am well. With kindest regards.

Yours affectionately,

S. Bhagavantam

S. Bhagavantam

Waltair
5th Sep. '33

*My dear
Dr. Hendricks
for peruse of
B. D. S. 10/11*

My dear professor,

I have carefully gone through the paper of Dr. Hendricks which you so kindly sent me. As I wrote to you in my last letter I was engaged in re-investigating the optical properties of naphthalene even before I got his paper. Although my results are still incomplete, I have been able to check some of my older observations with improved methods, such as the use of a Fedorow stage, particularly the measurement of the axial angle. Under a microscope, it is obvious that the naphthalene crystal is strongly optically negative and the semi-axial angle containing the obtuse bisectrix is about 55° . This would mean that the intermediate refractive index is very much nearer the maximum than the minimum and in fact, taking the two lower values of Dr. Hendricks (1.5238 and 1.7182) and the above semi-axial angle it can be shown that the maximum index should not exceed 1.788 whereas he gives it as >1.85 . I believe, therefore, that Dr. Hendrick's results about naphthalene are not consistent in themselves and I am unable to say where the difference exactly is between his results and those reported by me especially in the absence of any detailed data of Dr. Hendricks regarding the optic axial angle and the situation of the optical ellipsoid with respect to the crystal axes. I am ^{also} ~~however~~ unable to say anything just now about the absolute values of the refractive indices reported by me.

Regarding hexamethyl benzene, I note that my values are systematically higher than those of Dr.Hendricks and it is not unlikely that there may have been a systematic error either in my measurements of the thicknesses or in assuming the refractive index of the immersion liquid.

I do not think that I will be in a position to write anything tangible just now for publication and I would like to wait till I get more complete and reliable results and till I have a chance of seeing the fuller report of Dr.Hendricks.

I am returning herewith the two papers and the remarks of Dr. Krishnan.

With Kind regards,

Yours sincerely,

S. Bhagavantam.

Remarks by Dr. Krishnan

(I am enclosing herewith a letter and paper from Dr. Hendricks). I quite agree with him when he mentions that the densities of some of the single crystals used by me for the magnetic moments deviate considerably from ideal densities being in some cases 5 to 10% smaller. This is presumably due to some cavities inside and since I directly measure the volume susceptibility of the particular crystal used and divide by the value of the density for the same crystal, the specific susceptibility as obtained is not likely to be different from the actual value. (I am also enclosing a copy of a paper on the densities of crystals which is now in the course of publication in our journal).

As regards his remarks on Bhagavantam's optical measurements Hendricks seems to be under the impression that they were made with the same low density crystals as were used for my magnetic measurements. That Bhagavantam's results are different from Hendricks may probably be due to the fact that in calculating the birefringence $n_1 - n_2 = B$ say, by using the relation $Bt = n\lambda$

where n is the order of the bright fringe obtained on spectral analysis of the light passing through the crystal plate between crossed nicols, Bhagavantam assumes B to be nearly the same for any two adjacent fringes and $n \Delta \lambda$ and thus calculates n and hence B for different

λ_s from the known thickness t . Actually however I find that the second term on the right hand side of the equation

$$n \Delta \lambda = \lambda - t \Delta B$$

namely $t \Delta B$, which Bhagavantam neglects in comparison with λ , is usually not negligible.

Ramalingam
Vizagapatam

4th Aug. '35.

My dear Krishnan,

Your kind letter. The question of Asst. Professorship did come up before the Council but they have appointed me on their own terms. The terms they have offered me do not come up to my expectations and it is very unlikely that I would go there. I have not written to Professor finally yet but I have almost made up my mind not to accept it. I have, no doubt, certain difficulties ^{here} but I have corresponding privileges also.

I am not using the apparatus as I have my own made subsequently. I can send it on to you along with the quartz tube which I brought from there as soon as I find some one going there. How is old Nota Babu. How are things getting on at the Association. Are you sticking on or are you thinking of leaving?

With kindest regards.

Yours affectionately
S. Bhagavantam.