



राष्ट्रीय भौतिक अनुसंधान शाला
NATIONAL PHYSICAL LABORATORY

हिलसाइड रोड, नयी देहली-१२
Hillside Road, NEW DELHI-12.

तार : "नेटफिलेव"
TELEGRAMS : NATPHYLAB
फोन : ५८७१६१, ५८७६७३
TELEPHONES : 587161, 587673

संदर्भ
Ref. No. AM/MW/67/73

तिथि
Dated February 20, 1973

Dr. B.K. Agarwala
Head, Mechanics Division

Dear Prof. Hall,

You will kindly recall that during my visit to Provo last September I had taken from you quotations for a 200-ton cubic press for diamond synthesis. We have included this item in our budget proposals and as soon as these proposal are approved by the UNDP Headquarters in New York we shall place a final order. This will probably be in June or July. I have been asked by people here whether it would not be preferable to obtain from you a 'belt' press instead of a cubic press. I think the view is that if we finally decide to go to diamond synthesis to meet the country's demand of artificial diamonds it might be better to work from the start with the 'belt' device and upgrade it later to meet production needs.

If you agree to give us this device, it will not involve you in any dispute with the G.E. because if and when we decide to go in for production we shall settle matters with the G.E. ourselves. I shall be grateful to have your opinion on this. If you agree, may I request you to send us quotations for the 'belt' apparatus having a slightly higher capacity than the 200-ton cubic press. We would appreciate very much if you could also give us an idea of what a production process would cost and whether you would be in a position to make it for us. Is it likely that ~~we~~ we would revise your earlier decision and agree to assist us in the manufacture of diamond ?

I have gone through the very interesting papers on diamond that you gave me. In your paper entitled 'The Synthesis of Diamond' published in the Journal of Chemical Education Vo, 38, p. 484, 1961 you refer to the following equation on page 729

$$\log \text{ rate} = \text{constant} - \frac{\Delta V^\ddagger P}{RT}$$

Could you please point out a reference where a derivation of this equation is given ?

contd. 2/-

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2 March 1973

Dr. B. K. Agarwala, Head Mechanics Div.
National Physical Laboratory
Hillside Road, New Delhi-12, India

Dear Dr. Agarwala:

Thank you for your letter of February 20th. The cubic press is a superior device to the Belt in regard to carbide lifetime, ease of use, and simplicity of sample construction. However, if you prefer the Belt, we will be happy to build a belt type device for you.

Quotation

One only 300 ton Belt-Type apparatus complete with all hydraulics, electricals, controls, and with 8 extra carbide tapered pistons, 4 extra carbide chambers, and one extra binding ring set. The press would be complete and ready to run when plugged into utilities. Also included would be 50 regular pyrophyllite sample assemblies.

The price would be \$40,000.00 fob Provo. This price would be subject to adjustment at the time of delivery according to cost increases encountered during construction. The method of payment would be as follows: \$40,000.00US to be deposited at First Security Bank, Provo, Utah shortly after the placement of the order to purchase. These funds would be released to H. Tracy Hall, Inc. at the time of shipment. Prior to shipment the apparatus will be set up and placed in working order in Provo for inspection by your people before your acceptance of the machine.

A production apparatus of the Belt-Type would cost \$150,000.00 and we would be happy to construct one for you. However, I am still not in a position to help you get started in diamond manufacture.

The equation $\log \text{rate} = \text{constant} - V P/RT$ is derived from the differential equation No. 148, page 470 of "The Theory of Rate Processes" by Glasstone, Laidler, & Eyring, McGraw-Hill, 1941. A zerox copy of Chemistry at High Temperature and High Pressure is enclosed.

With best wishes,

Sincerely,

H. Tracy Hall

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In the above mentioned paper there is also a reference to a paper by you published in the Proceedings of the Symposium on 'High Temperature - A Tool for the Future' published by the Stanford Research Institute, Menlo Park, California. In spite of our efforts we have not been able to get a copy of these Proceedings.

Could I request you to kindly let me have a Xerox copy of this article ? It occurs on pages 161-166.

With kind regards,

Yours sincerely,

Bhagawala
(B.K. Agarwala)

Prof. H. Tracy Hall,
Department of Chemistry,
Brigham Young University,
Provo, Utah 84601
USA.

40002748