#1 D. H. Lauder
#2 C. H. Gross
#3 F. E. Baker
#4 F. W. Wilson
#5 L. F. Huck - Pittsfield
#6 C. W. J. Wende
#7 A. B. Greninger
#8 A. B. Greninger
#9 Carleton Shugg, A.E.C.
#10 700 File
#11 Pink Copy
#12 Yellow Copy

October 14, 1947

Mr. D. H. Lauder
Works Manager
HANFORD WORKS

GRAPHITE PURIFICATION

On October 6 and 7 in New York City meetings were held to discuss the possible application of United Carbon Products' purification process to Hanford graphite now being produced by National Carbon. Attending these meetings were Messrs. Currie and Hamister of National Carbon, Beckerley, Kelley, and Held of New York A.E.C., Lyn Brooks and G. T. Sermon of United Carbon Products, and Anderson, patent attorney from A.E.C., Washington.

Process

The purification process covering the treatment of graphite with fluorine is covered by a patent application filed by Lyn Brooks of UCP. UCP has been operating a small furnace for the A.E.C. in Bay City, Michigan, capable of treating one bar about 4 x 4 x 11 inches. The process they have used is as follows:

> They have not determined optimum conditions. The charge is heated with an electric furnace and CCl_4 is introduced at 800°C and the temperature is increased to 2000° and then CCl_2F_2 is passed through the charge for one-half to two hours while the temperature is raised to 2400°C. The furnace is then purged with oil-pumped nitrogen and is allowed to cool. Mr. Brooks stated that for removal of boron only they would omit the CCl_4 treatment and use only CCl_2F_2 (Freon 12). Note that fluorine is not brought into contact with graphite until the temperature has been raised to 2000°C or above. At lower temperatures fluorine has a decidedly bad effect on the physical properties of graphite.

Agreements

National Carbon will immediately undertake to determine whether or not this process can be applied to the purification of graphite on a large tonnage basis, using the excess graphitizing furnace capacity available at the Morganton plant. First trials will probably be made on a single layer of bars (instead of the seven layer charge used in graphitizing) with the gas

introduced through perforated graphite pipes and using coke instead of silicon carbide for insulation. The furnace will have to be provided with ventilating equipment to remove exit gases from the building, which gases would otherwise have a severe corrosive effect on the building structure; also, phosgene is generated during this purification treatment. Mr. Sumister estimated that a four-day purification cycle, charge to charge, may be possible for a single layer loading. This is to be compared with the forty-day cycle for graphitizing a seven layer loading. National Carbon is now proceeding with an engineering study of the steps that must be taken in order to prepare for a trial of this process in a single furnace.

Contract and Lease

Mr. L. F. Hull was advised of the above agreements. On October 14 he will contact National Carbon and the Great Lakes Carbon Company to determine how, if at all, General Electric's lease with Great Lakes must be modified to include this purification operation in the Morganton plant. He will also make certain G.E.'s contract with National Carbon is adequate to cover reimbursement for these operations.

Patent Agreement

Mr. Anderson, patent attorney for A.E.C. Washington, was at first insistent that National Carbon sign a patent agreement guaranteeing improvement rights to the Government before he would allow National Carbon to talk with WUP about this process. However, after some discussion among Anderson, Spangler, and National Carbon attorneys, it was agreed that discussions should proceed and the matter of patent agreements would be resolved at some later date.

AB Groningerlef