

Oberhausen - Holten

May 7, 1940

Outlineof a Letter to the LicenseesRe: Kieselgur - Supply

When we found that only kieselgur could be used as a support for our catalysts, we examined the various gur-deposits in Germany in regard to their usefulness for our purposes. Finally we found ourselves to be limited to the kieselgur deposits located on the Luneburgerheide, where the quality as well as the quantity of the deposits corresponded to our needs. These mines are organized in the "Verinigtes Deutschen Kieselgurwerken, Hannover." (V.D.K.) and a part thereof, furthermore, in the "Kieselgur Industrie (K.I.) Hannover." These organizations which for years had specialized in selling kieselgur, did not know anything about kieselgur except that:

1. Kieselgur is a natural product of very different qualities in regard to its physical as well as to its chemical properties, and that even the various deposits found in the same mine may vary, so that it is very hard to obtain larger lots of uniform quality, and that.
2. The total deposits in the Luneburgerheide - mines will give a sufficient supply for approximately one hundred years.

Of course, these primitive insights did not meet the demands which we had to make in regard to kieselgur which would be used for preparing catalysts. Therefore we started very intensive and detailed studies in order to find out the most desirable deposits and the operating conditions in the mines for producing the necessary gur in large quantities and in uniform qualities.

Until we became kieselgur consumers, this material had been mined out and worked up in the following way:

During the summer months, making use of the favorable weather, such quantities of gur were mined that the shipments could be kept up also during the winter months, when the mining operations would be discontinued in September. The raw gur was first spread out and dried in the air, and then it was stored in big heaps in open sheds. Here the gur was freed from the major part of organic substances by a kind of pile charring. In accordance with the actual qualities

requested, a gur was thereafter ground, sifted, and shipped, or it was brought to the town of Unterloess without being sifted. In Unterloess, the gurs were ignited once more in a revolving furnace at a higher temperature.

Our initial tests showed that a gur which had only been treated by pile charring was not fit for the preparation of catalyst masses. The current charring process was not uniform and failed to improve the heterogeneity of the gurs; it made them of more heterogeneous qualities, if anything. That is why we were limited to the gurs which had been produced by the Unterloess unit.

To be sure, also the ignited gurs were of very varying qualities. However, already in the summer of 1937, we were enabled by our observations about the behavior of the individual gur qualities in regard to the preparation of catalysts and the synthesis reaction, to state our preliminary specifications for gurs, resp. for their chemical composition. Thereby, it was found that the products of individual mines had to be mixed in a definite ratio, in order to provide a material conforming to our specifications.

However, it had become apparent in the meantime that with the pile charring process 4000 tons of gur per month could not be produced. Therefore, in 1937 we prevailed upon the V.D.K., resp. those mine operators who produced those raw gur brands which we wanted, to construct roasting furnaces at the mines. Thereby we wanted to secure:

- a. An increase in production by eliminating the lengthy drying and charring procedures, and also
- b. A greater homogeneity of the material by passing it through a roasting furnace.

(Text illegible)

Suddenly, in December 1938, resp. January and February 1939, the quality of the kieselgur deteriorated again. At that time, this had the consequence that the K.I. wrote us they wanted to cancel our contract, since they failed to dispose of the gur-qualities which we wanted. For the purpose of studying this sudden deterioration we emitted chemists to Unterloess and to the mines. Indeed, they found that gur which had been mined during the summer months, stored in large heaps and processed in the roasting furnaces only after months of lying around, had undergone undesirable changes by this type of open-air storage, so that all the ignited gurs (Gluhguren) which had been produced therefrom, were useless for our purposes. This experience taught us that the raw gurs destined for us must be roasted without delay in order to prevent a deterioration of their quality, and that meant that the mines must also be mined during the winter months.

(A discussion of different steps taken in order to secure a sufficient supply for Ruhrchemie, follows)

However, we are convinced that K.I. will go on trying to circumvent the government regulations, and we shall have to watch the production at the roasting furnaces and that at Unterloess as well as the shipping, if we want to avoid future production difficulties.

As we explained above, in view of the heterogeneity of the raw gur produced, a finishing treatment of the charred gur and, later on, of the roasted gur was necessary, in order to secure a homogeneous material which would be as stable as possible. By appointing a resident chemist and by constantly testing the raw gurs in the mines in regard to their suitability for our purposes, as well as by supervising their subsequent processing in the roasting furnaces, we felt justified in trying to use these gurs as they were issued from the roasting furnaces, without having them undergo the finishing process in Unterloess. This decision originated because the ignited gur (Gluegur) shipments made in the autumn of 1939 were perfectly insufficient. You (the licensees) have been informed that roasted-gurs were used and you were requested to let us know how they worked in the reactors. Up to this date no unfavorable results have been reported in regard to the catalyst mass prepared from roast-gur. Since the K.I. is unable to deliver the contracted quantities of ignited gur, we shall in future use still larger portions of roast-gur for producing catalysts, a procedure to which you have already agreed.

If we should find out by these large scale tests that roast-gur may be generally used for producing catalyst masses, we should be able:

1. To avoid the Unterloess bottleneck, which is jammed with the demands of other customers, and to secure a smooth-working supply, and
2. To save about 30 to 40% of the gur costs, which is quite an important sum in view of the fact that gur is a waste product which cannot be recovered.

(Rest not translated)

M. Beth

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