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DR. J. H. COOPER (3)

SPECIAL GRINDING STUDIES
DECEMBER, 1950

A-IIC-261 AJS - 60%

The work during September may be divided into several phases all concerned with aqueous grinding.

Semi-Works Grinds

Two aqueous grinds of CPC-LB were made in the semi-works HF mixer using 5% and 10% Blancol. Unexpected difficulty was encountered in filtering the lab. control samples. An extraction study was also undertaken without any good leads developing and no good samples were obtained from the grind with 10% Blancol. Samples on the grind with 5% Blancol suggest that it is similar to lab grinds. Semi-works extractions have not been made.

Laboratory HF Grinds

Several laboratory grinds of CPC-LB have been made with a variety and combination of agents. The Physics Lab. has developed a new technique which measures a function of light scattering by means of transmission measurements of pigment dispersions in the spectrophotometer. Since light scattering is a function of particle size, this measurement gives a relative, but not yet absolute, measure of particle size. By this method a series of grinds in which the Blancol was varied from 5 to 20%, based on CPC, showed evidence of diminishing particle size with increasing Blancol. The test also indicated that the 20% Blancol grind gave a particle size below that of BP-192-D, the current W.D. lake standard. When tested as dispersed pastes by brushout vs. BT-321-P, these samples show the expected tendency to increasing strength with increasing Blancol. With 7.5% Blancol and above, the products are stronger than BT-321-P. When tested by rubout, these samples were unexpectedly strong compared to samples made heretofore by similar processes, the dry products made using 5% and 7.5% Blancol being only 3-5% weaker than BT-304-D and flushed products actually stronger than BT-304-D. As in previous studies, increasing Blancol tends to serious weakness in oil, even when flushed.

A series of grinds using sand alone and sand with a small amount of borax gave very weak products as dispersed pastes. It was also noted that the sand resulted in very rapid abrasion of the grinding discs.

The use of other agents than Blancol has been further investigated with some interesting results. In general Blancol alone has given the best results for use in aqueous systems. Brij 35 (a non ionic agent from Atlas), when used in larger amounts, has given products as good as or better than Blancol treated products for use in oil. The same agent has given interesting results in combination with Blancol and seems to deserve further investigation. Likewise CMC has again given results of mild interest, but seems no more desirable than other agents tried.

W.D. Lakes

The observation by the Physics Lab. that grinds with relatively large amounts of Blancol were giving particle sizes apparently smaller than that of BP-192-D suggested that water dispersible lakes might be prepared directly from the crude in the H.F. mixer. Although the work to date has been limited, it is most encouraging and is being followed up actively. In essence, the process involves grinding in a typical pigment-borax-water mixture containing the full amount of Blancol normally present in a W.D. lake. At the end of the grinding cycle, the mixture is diluted with water, separated from the borax by decanting and sufficient dextrin added under simple agitation to give the desired pigment concentration allowing for the borax in solution. The mixture is then pan dried. The products give suspensions in water surpassing that of BP-192-D in clarity and, by brushout are similar in strength to BP-192-D assuming equal CPC content (not yet been verified by analysis). The products made from LB crude have been very green, and experiments are under way to show whether the greenness arises from the crude used or from the process. The process is also being applied to CPC-BG and to CPC Green.

With effective re-use of the borax removed by decantation, it appears that this process might be operated with a consumption of borax not exceeding 1 pound per pound of CPC and that it offers an easily realizable low cost process for W.D. lakes that would not require preliminary grinding in the Newport ball mills.* This study will be carried forward actively.

**Also eliminate plastic milling of present Borax process. g.H.*

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