

same process as gold; that is to say, it is mixed with a small quantity of the same flux as that used for gold, and being ground with oil of spike is applied with a brush to the porcelain, after which it is burnt-in under the muffle of an enameller's furnace and then polished with a burnishing tool."

Little commercial use seems to have been made of matt platinum decoration before the beginning of the present century, but in our own time it has come into vogue for the finishing of fine quality china and porcelain, particularly for tea and dinner-ware.

We thus see platinum first appearing on pottery as a lustre, a cheap ceramic substitute for sterling silver or combined with coloured enamels to decorate "peasant" wares for sale at country fairs.

Today its cost is such that matt platinum is seldom seen as more than a narrow band or line, the final luxury of finish on costly services, while platinum lustre is mainly confined to resist decoration on pieces made solely for their ornamental value.

Hydrocracking on Platinum Isomerisation Catalysts

A COMPARISON OF ALUMINA AND SILICA-ALUMINA BASES

Catalysts used in pentane or hexane isomerisation processes require two types of reaction site – the platinum sites where dehydrogenation and subsequent hydrogenation occur and acid sites, provided by the supports, where isomerisation of the dehydrogenated product takes place. An undesirable side-reaction, hydrocracking to lower molecular weight paraffins, has been studied by C. G. Myers and G. W. Munns, Jr., of the Socony Mobil Oil Co. Inc. Their results are published in a recent paper (*Indust. & Eng. Chem.*, 1958, 50, (12), 1727-1732).

The hydrocracking of *n*-pentane, -hexane and -heptane was studied using isomerisation catalysts comprising platinum on alumina and platinum on silica-alumina. The hydrocracking of *n*-pentane can be correlated with the dehydrogenation activity of the catalyst – a function of the platinum sites – but is not directly related to the nature of the acidic support. The products of the cracking reaction are evenly distributed over the range C₁-C₄ hydrocarbons and this distribution is not affected by altering the catalyst support. However, the change in pentane hydrocracking activity per unit change in dehydrogenation activity is less for platinum-alumina than for platinum-silica-alumina catalysts, with the result that the hydrocracking activity

is in general less for platinum-alumina when the two catalysts have the same dehydrogenation activity. This may be explained by chemical interaction between platinum and the siliceous support. These results suggest that hydrocracking of *n*-pentane is catalysed by the platinum sites.

Hydrocracking of *n*-hexane and *n*-heptane does not give rise to an even distribution of cracking products but to a higher proportion of hydrocarbons derived from cracking at the centre-bond. This is a characteristic of cracking at acid sites. It is shown conclusively in the case of *n*-heptane that the more acidic silica-alumina support favours centre-bond cracking to a greater extent than the alumina support.

The results obtained indicate that on dual-function isomerisation catalysts two types of cracking can occur depending on the chain length of the hydrocarbon. Platinum-catalysed hydrocracking, giving an even distribution of reaction products, occurs alone in *n*-pentane and together with acid-catalysed cracking in *n*-hexane. Acid site hydrocracking alone occurs in *n*-heptane. It is suggested that platinum-catalysed hydrocracking occurs via the olefin intermediate produced in the isomerisation reaction by dehydrogenation at the platinum sites.