upon the size of the adsorbate molecules. In the case of methanol reforming the phenomenon will not be an important consideration, unlike the position for the hydrogenation of the unsaturated hydrocarbons, where $R_{S_{max}}$ is greater than the smallest palladium crystallite radii which can be prepared in the unsupported state.

Catalyst Design

The wide variation in the value of N found in the palladium blacks after hydrogen pretreatment and the uncertainty in the value of d makes precise estimates of $R_{S_{max}}$ for other catalysts difficult. Nevertheless, it would not be unprofitable when designing a catalyst (particularly an unsupported one, but also a supported one), to use an average value of N (i.e. N=6) and approximate estimates of d, to predict the optimum particle size which will give the maximum specific surface area available for adsorption ($2R_{S_{max}}$) and thus maximum activity. There is no justification for decreasing ad infinitum the crystallite size of unsupported catalyst particles (16) in macroscopic aggregates without regard to this perhaps eventually having a detrimental effect upon the activity per unit weight of the catalyst.

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The Fabrication of Iridium Crucibles

DEEP DRAWING TECHNIQUES INVESTIGATED

Iridium has the greatest tensile strength of the platinum group metals and its melting point is 2443°C. Consequently, it has not proved to be an easy metal to fabricate in the past but efforts are continuing to improve the methods of working it. This technology has been stimulated by the increasing use of iridium in crucibles for growing single crystals from oxide melts (B. Cockayne, *Platinum Metals Rev.*, 1974, **18**, (3), 86–91).

A recent report from G. Reinacher of Degussa, Hanau (*Metall*, 1974, **28**, (7), 657–661) now shows that iridium can only be deep drawn satisfactorily to form seamless crucibles if the work on the iridium sheet is carried out above the recrystallisation temperature of the metal at ~1000°C. Tests included cupping from iridium discs 0.3 mm thick and 55 mm diameter, some being of cast iridium sheet and others of sintered iridium with and without ruthenium additions. The former for shaping the iridium was first heated to 620°C and later to 750°C. Variations in technique also included trials at pressures between 200 and 1000 kp, various widths of drawing gap, and intermediate annealing after the first 5.5–8 mm cupping. However, none of these techniques eliminated the formation of creases and the conclusion that working above ~1000°C is necessary was therefore reached.

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