New Acetyls Complex Commissioned at Hull

RHODIUM COMPOUND CATALYSES KEY REACTION

Although there are no accurate data, the world demand for acetic acid is probably of the order of 10 billion pounds per year, for which the main applications are in the production of vinyl acetate, cellulose acetate, esters and terephthalic acid, which in turn find use in a wide range of manufacturing industries including adhesives, dyes, films and plastics, herbicides, inks and paints, pharmaceuticals, and textiles.

Of the three basic ways of producing acetic acid, the carbonylation of methanol is regarded as the lowest cost route when both capital costs and variable costs are considered. The share of total production accounted for by carbonylation has grown substantially over the past decade, a situation which will be consolidated by the recent completion and commissioning of a new acetyls complex for BP Chemicals Limited at Hull, England. The new plant has a capacity of 175,000 tonnes per year and is believed to be unique, in that it manufactures both acetic acid and acetic anhydride in the same reaction chamber; furthermore, by changing the reaction conditions, it is possible to "swing" the reaction and so change the ratio of acetic acid to acetic anhydride produced. Thus the output of acetic acid can be varied between 40 and 60 per cent of total output, depending upon market requirements.

The process technology involved was developed by BP Chemicals, and is an elegant modification of the Monsanto methanol carbonylation process for acetic acid manufacture, which was first developed in the early 1970s, and reported here at that time (J.F. Roth, "The Production of Acetic Acid", *Platinum Metals Rev.*, 1975, **19**, (1), 12).

A significant modification made by BP Chemicals to the earlier Monsanto process involves reacting a part of the methanol feedstock with recycled acetic acid, forming methyl acetate. The latter, together with the remainder of the methanol, is then treated with carbon monoxide; this reaction being promoted by a rhodium-based liquid-phase catalyst. The use of this rhodium catalyst in the presence of an iodide promoter enables the reaction to take place at about 185°C and 40 bar.