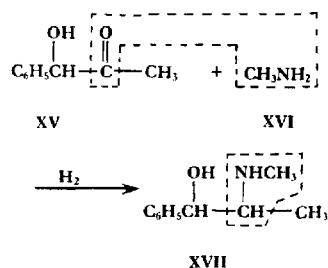


## Ephedrine

This ancient drug once produced by extraction of the Chinese plant, Ma Huang, is now made synthetically. The Neuberg fermentation process yields the optically active ketol (XV) which will undergo a stereospecific reductive amination with methylamine (XVI) in the presence of a platinum catalyst (8) to give 1-ephedrine (XVII).



Another noteworthy feature of using platinum or palladium catalysts is the ease with which they can be recovered from a process economically and practically quantitatively.

Certainly the above examples should suffice to show the versatility and usefulness of low pressure hydrogenation reactions employing platinum and palladium catalysts.

## References

- 1 H. Lindlar .. .. . A New Catalyst for Selective Hydrogenation. *Helv. Chim. Acta*, 1952, **35**, 446: Hydrogenation of Acetylenic Bonds Utilizing a Palladium-lead Catalyst. U.S. Patent 2,681,938 (1954)
- 2 M. Tishler and J. W. Wellman .. Alloxazines and Isoalloxazines and Processes for Their Production. U.S. Patent 2,261,608 (1941)
- 3 M. Tishler .. .. . Tetraacylribonyl-xylylidine. U.S. Patent 2,420,210 (1947)
- 4 R. Pasternack and E. V. Brown .. Process of Preparing Aldehyde Acylated Ribose, and Product Thereof. U.S. Patent 2,237,263 (1941)
- 5 S. A. Harris .. .. . Ethers of Vitamin B<sub>6</sub>. U.S. Patent 2,382,876 (1945)
- 6 R. L. Peck .. .. . Dihydrostreptomycin and Acid Addition Salts. U.S. Patent 2,498,574 (1950)
- 7 J. S. Lawhead, R. Mozingo and J. van de Kamp .. .. . Reduction of 12-Ketosteroids to 12-Hydroxysteroids. U.S. Patent 2,538,109 (1951)
- 8 G. Hildebrandt and W. Klavehn .. Manufacture of Laevo-1-phenyl-2-methylaminopropanol-1. U.S. Patent 1,956,950 (1934)

## Platinum Catalyst in Butane Isomerisation

A new process has been developed by Universal Oil Products Company for the economical conversion of normal butane to isobutane, required in increasing quantities as a component of alkylation plant feed stock with the growing use of alkylate for blending into high-octane motor spirit.

In developing this new conversion process, known as the Butamer process, the primary objective was the development of a stable and rugged catalyst capable of operating at relatively low temperatures. In this way the concentration of isobutane in the reactor

effluent could be maintained sufficiently high to eliminate an excessive amount of recycle of normal butane. The object has been achieved by the use of a specially prepared platinum-bearing catalyst of high activity which makes it possible to operate the process at economical liquid hourly space velocities, thus providing for a reasonable catalyst inventory. The usual impurities that may be expected in commercial operations act only as temporary suppressors of catalyst activity and the process design may be readily arranged to eliminate any such materials.