Citation for Chemical Breakthrough
For the Development of Homogeneous Catalysis


The Preparation and Properties of Tri(s-triphenylphosphine)halogenorhodium(I) and Some Reactions thereof Including Catalytic Homogeneous Hydrogenation of Olefins and Acetylenes and their Derivatives

Our first studies were made using a rhodium(III) complex stabilised by triphenylphosphine. During the preparation of this phosphine complex we found that when an excess of triphenylphosphine was used, a rhodium(I) complex, RhCl(PPh₃)₃, results. This rhodium(I) complex, and the corresponding bromide and iodide, have proved to be the most effective catalysts yet recognised for the homogeneous hydrogenation at normal temperatures and pressures of a variety of unsaturated compounds containing both double and triple bonds.

![Graph](image-url)

**Figure 2** Qualitative comparison of the rates of homogeneous and heterogeneous catalysis, (○) 10⁻⁴ moles of RhBr(PPh₃)₃ in 1:1 benzene-ethanol, (×) 10⁻⁴ moles of Adams' catalyst in glacial acetic acid.

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