Disproportionation of Hept-2-ene by a Homogeneous Tungsten Hexachloride–Grignard Reagent Catalyst

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Summary A mixture of tungsten hexachloride and a Grignard reagent is an active homogeneous catalyst for the disproportionation of hept-2-ene.

HOMOGENEOUS catalysts consisting of metal chlorides activated by organoaluminium halides, alkyl-lithium, or tetra-alkyltin have been reported to be effective for olefin disproportionation.[1] We report an excellent catalyst system derived from WCl_6–BuMgI, which converts hept-2-ene into butene and dec-5-ene in benzene at room temperature. The olefins were identified by mass spectrometry and g.l.c. The conversion attained the theoretical maximum (at which 50% of the original olefin was converted) within 2 h in experiments at room temperature with ratios of olefin/W = 100, and BuMgI/W = 2. The benzene solution of the Grignard reagent was prepared as described by Schlenk.[2] Addition of ether or tetrahydrofuran to the benzene solution effectively destroys the catalytic activity.

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