Mechanism of Dehydrobromination of 1,2-Dibromo-1-phenylethane under Conditions of Phase-Transfer Catalysis

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Abstract - Selective dehydrobromination of 1,2-dibromo-1-phenylethane to α-bromostyrene was effected under conditions of phase-transfer catalysis in systems containing KOH, toluene, and tetraalkylammonium bromides. The high selectivity of the catalytic systems originates from stabilization by lipophilic cation of the phase-transfer catalyst of a E1cb-like transition state in the E2 mechanism. In the presence of a catalytic amount of lipophilic alcohols, phenylacetylene was obtained. Substrate activation by alcohol molecules is explained by enhancement of the acceptor power of halogen atoms due to solvation and by increased mobility of hydrogen atoms.