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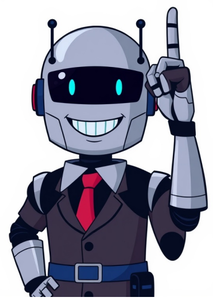

The objective of this experiment is to perform an addition reaction between trans-stilbene and a bromine reagent, resulting in the production of 1,2-dibromo-1,2-diphenylethane. ========== Bromine and chlorine exhibit rapid addition reactions with alkenes. This experiment focuses on the bromination of trans-stilbene using a 10% bromine dichloromethane solution. Consequently, an addition reaction occurs, yielding 1,2-dibromo-1,2-diphenylethane. ========== The alkene (trans-stilbene) functions as a nucleophile, and the bromine acts as an electrophile. This leads to the nucleophilic double bond undergoing an electrophilic addition reaction by the bromine reagent. The Br–Br bond becomes polarized, causing the more positively charged Br atom to be transferred to the alkene, resulting in a bromonium ion. ========== The addition of bromine begins on one side of the double bond, which can occur at either side with equal likelihood. Following this, the attack by bromide ion on the bromonium ion also occurs, but only at one carbon atom since the ion is symmetric. This results in a trans dibromide. ========== The product, 1,2-dibromo-1,2-diphenylethane, possesses two stereogenic centers, which typically leads to four possible stereoisomers (22 in this case). However, there are only three possible isomers due to the existence of a meso isomer that is superimposable on its mirror image. ========== 5g of trans-stilbene were added to a conical flask, followed by 40cm3 of dichloromethane. The flask was swirled until the stilbene dissolved. Approximately 15cm3 of 10% bromine-dichloromethane solution were carefully measured and added in two stages. Cyclohexene was added dropwise to the flask until the bromine color disappeared. ========== Experimental data was recorded, and the results indicate a percentage yield of 60.07%. The melting point range of 1,2-dibromo-1,2-diphenylethane was found to be 240.2o to 241.7o C. ========== Errors in the experiment included: (i) residual trans-stilbene on the weigh boat; (ii) incomplete transfer of crystals from the Buchner funnel; and (iii) insufficient time for the flask to cool, resulting in less crystal formation. ========== The objective of this experiment was achieved by brominating trans-stilbene, yielding 5.67g of 1,2-dibromo-1,2-diphenylethane with a percentage yield of 60.07%.