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CHEMICAL PROPERTIES OF SOME 1,1,2-TRIFLUOROPENTADIENES

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A study has been made of some chemical properties of three 1,1,2-trifluoropentadienes. The first two were conjugated dienes, one containing an electron releasing group and the other an electron withdrawing group. They were made by adding $\text{CF}_2\text{BrCFClBr}$ to propene and CF_2ClCFCl I to 3,3,3-trifluoropropene, respectively, and dehydrohalogenation and dehalogenation to produce $\text{CF}_2=\text{CFCH}=\text{CHCH}_3$ (I) and $\text{CF}_2=\text{CFCH}=\text{CHCF}_3$ (II). The third diene, an unconjugated perfluoro compound, was made from $\text{CF}_2\text{ClCFClCF}_2\text{CF}_2\text{CO}_2\text{Na}$.

Diene I had a marked ability to react with itself even at 0° to form the perfluorocyclobutyl derivative. When I was heated with $\text{CF}_2=\text{CFCl}$ or $\text{CF}_2=\text{CCl}_2$ only the dimer of I was formed. Diene II formed the cyclobutyl dimer at 100° and, when heated with I, formed all three of the possible perfluorocyclobutyl products. The unconjugated perfluoropentadiene formed no cyclic products either alone or with $\text{CF}_2=\text{CFCl}$.

Both I and II reacted with phenylmagnesium bromide to give the dienes in which a fluorine atom had been replaced by a phenyl group. Ethanol in the presence of base reacted with I to give a mixture of 1,2- and 1,4- addition products in a ratio of 4:1. Pentafluorodiene II gave only the ether resulting from 1,4- addition of alcohol.

Radical reactions with bromotrichloromethane were also carried out. Mechanisms to account for the products will be presented.

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FRIEDEL-CRAFTS REACTION OF TRIFLUOROPROPENE: AN APPROACH TO A NEW GROUP OF USEFUL FLUORINE COMPOUNDS

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The Friedel-Crafts reaction of 3,3,3-trifluoropropene with aromatic compounds gave 3,3,3-trifluoropropyl compounds. The reaction occurs at the terminal position of the propene and gives linearly alkylated products, while propene reacts at the secondary carbon atom. Some of the products have better properties as capacitor oil than aromatic hydrocarbon oils.