Mechanism of Initiation of Cationic and Anionic Polymerization of Methylenecyclobutenes

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Abstract—The mechanism of initiation of cationic and anionic polymerization of methylenecyclobutenes, yielding different polymeric products, was studied quantum-chemically on the basis of electronic excitation in an elementary chemical process, using the formalism of free valence indices. In the cationic polymerization, the polymer chain consists of cyclobutene fragments linked by methylene bridges, and in anionic polymerization, of saturated cyclobutane fragments linked directly to each other and containing exocyclic methylene substituents.

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