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An Investigation of the Interaction of 4-Membered Rings with Adjacent Carbanion Centers

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Abstract: A series of cyclobutylcarbinyl phenyl ketones was prepared and the rates of base catalyzed hydrogen-deuterium exchange of α -hydrogen atoms were compared with those of appropriate model compounds, to test the validity of an earlier finding, which suggested that a four-membered ring, like the three-membered ring, has the ability to stabilize an adjacent carbanion center. In this study, unlike the cyclopropyl group, no clearly defined stabilization of the adjacent carbanion center was detected by the 1-phenyl- and 1-p-nitrophenyl- substituted cyclobutyl groups and only a very slight rate enhancement by the 3-phenylcyclobutyl group was detected. Attempts to detect a stabilization of the carbanion center by a cyclobutyl-substituted methyl group (homoconjugative interaction) also failed.

Key Words: Carbanions, cyclobutylcarbinyl, cyclopropylcarbinyl, strained molecules

Keywords
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