SYNTHESIS STUDIES FOR CHELATORS OF GADOLINIUM

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This research's goal was to construct a tert-butyl ester building block to help synthesize a Magnetic Resonance Imaging, MRI, contrast agent. The contrast agent binds to Gadolinium (III), Gd (III), to confer properties, such as brightness and duration to receive a good scan. The ester building block is utilized to make the organic part of the contrast agent, by attachment with Gd (III), however it is not in the final product. This five-step experiment aims to create a pure, clean and high yielding method to make the chelate part of the contrast agent without purification until the last step. The final product is synthesized from simple and cheap chemicals, malic acid and cyclohexanone. The current synthesis of the building block uses methyl ester, which is complete with removal by a base; in this research, the objective is to construct a tert-butyl ester with removal by an acid. From this feature, the tert-butyl ester may be a better method to make the organic part of the contrast agent easier than the methyl ester. Proton NMR and TLC characterize the final product, purity, and determine if other by-products have formed.