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Green Chemistry Abstract

Abstract of the Green Synthesis of an Analogue of Capsaicin

A three step synthesis was carried out to produce an analogue of capsaicin, which is the molecule that gives chili peppers their "heat". It is often used in topical creams for minor muscle pain. In the first step, octaldehyde was oxidized by Oxone (a monopersulfate compound) to become octanoic acid. This product was reacted with thionyl chloride in the second step to add chlorine in order to produce an acid chloride. For the third and final step, the acid chloride was reacted with a methylbenzylamine to produce an analogue of capsaicin. The goal of the experiment was to see how "green" or environmentally friendly the process of creating the analogue could be with our available resources. This was to be done by switching a typical reagent for a greener one in one of the steps, and replacing a typical solvent with a greener one in another step. The recommended reagent that was replaced in the green synthesis was Oxone, which was replaced in the first step of step with potassium permanganate. The solvent that was recommended was dimethylformamide which was replaced by dimethylsulfoxide. The product of each step was confirmed by thin layer chromatography (TLC) and/or nuclear magnetic resonance spectroscopy (NMR) analysis.