

Green Chemistry: Three Step Synthesis of Acetaminophen

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Acetaminophen was synthesized from phenol in three steps. In this synthetic route one of the steps was altered to be more green through a better atom economy and the use of a less hazardous solvent. The first step was an electrophilic aromatic substitution on phenol with nitric acid to create nitro-phenol. Next, nitro-phenol was used to synthesize p-aminophenol through hydrogenation using an iron catalyst. This step was also attempted using a more eco-friendly solvent in order to make it more green. Lastly, acetaminophen was synthesized by the acylation of the aminophenol. This new method including the green step minimized chemical waste.