

The synthesis of coumarin with the application of green chemistry
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Coumarin is a fragrant organic compound that is of importance in perfumery, medicines, and dyes. Moreover, coumarin shows anti-HIV, anti-fungal, and anti-cancer activity. In this experiment, coumarin was synthesized from phenol in a three-step synthesis. This three-step synthesis utilized several common organic reactions, oxidation and addition to give us the ability to create our final product. The purification and analysis methods used included flash chromatography, thin layer chromatography, extraction and nuclear magnetic resonance (NMR). Green chemistry is creating a new reaction from existing methods to protect the environment by replacing or substituting other materials. To classify a greener alternative, the reagents or solvents should have the ability to create less waste and be less hazardous to the environment. For our greener substituent, we have prescribed sodium hydroxide as a substitute for sodium hydride as our greener reagent. For our greener solvent, methyl *t*-butyl ether was chosen to replace tetrahydrofuran (THF).