

## ABSTRACT

**SITI NURHASANAH.** Synthesis of Nitro Coumarin Derivatives. Mini Thesis, Chemistry Study Program, Faculty of Mathematics and Natural Sciences, Universitas Negeri Jakarta. August 2021.

The structure of coumarins, commonly known as benzopyran, is a phenolic molecule that has been widely used for the treatment and prevention of various diseases. The benefits and bioactivity of coumarins have been widely reported in previous studies. Sequel reactions are often carried out to produce coumarin derivatives with certain functional groups to produce the desired biological activity. One of the coumarin derivatives that have many benefits is nitrocoumarin. This study aims to study the coumarin synthesis process followed by nitration and to obtain nitrocoumarin derivatives. In this study, coumarin synthesis was carried out mechanically (stirring) without using a solvent and followed by nitration through a simple method. The coumarin synthesis process was monitored by thin layer chromatography (TLC) and the purification of the compound was carried out by recrystallization. The synthesized product was tested for purity by melting point test and structural determination was carried out by UV-Vis,  $^1\text{H-NMR}$ ,  $^{13}\text{C-NMR}$ , and HSQC spectroscopy. This synthesis used 1 mmol resorcinol and 1 mmol ethyl acetoacetate with  $\text{H}_2\text{SO}_4$  as a catalyst and optimization of reaction conditions was carried out by increasing the temperature and reaction time. The optimum reaction conditions were obtained at a temperature of  $40^\circ\text{C}$  for 30 minutes to produce a yield of 45%. The result of coumarin synthesis was nitrated using  $\text{H}_2\text{SO}_4$  and  $\text{HNO}_3$  at low temperature. Based on the results of the study, the nitrocoumarin obtained was thought to have the structure of 6-nitro-7-hydroxy-4-methylcoumarin.

**Keywords :** *Synthesis coumarin, Pechmann reaction, optimization, nitration.*