

ABSTRACT

L-Quebrachitol is the natural derivative product from the rubber industry. Box-Behnken Design (BBD) is widely used method which involves both mathematical and statistical technique for constructing the relationship between a response variable and design variable. This method mostly applicable in order to optimize the best parameters for extraction purpose. The effects of ethanol and acetone proportion, extraction temperature and deionized water volume on total L-Quebrachitol yield were investigated.

The optimization of extraction of L-Quebrachitol from natural rubber wastewater done using different parameters which are ethanol concentration, acetone concentration, temperature and volume of deionized water. Based on output result generated by the regression equation, $Y = \beta_0 + 0.1694X_1 + 1.034X_2 - 1.389X_3 + 6.082X_4$, which X_1 for Deionized water (ml), X_2 for Acetone concentration (%), X_3 for Temperature($^{\circ}$ C), X_4 for Ethanol concentration (%) shows that ethanol concentration gives the most positive effect on the extraction of L-Quebrachitol while the temperature gives negative impact on the extraction of L-Quebrachitol. The IR spectrum of the isolated compound was found super identical with that of the standard L-Quebrachitol. Based on the LCMS analysis, peak of L-Quebrachitol was detected in the standard and sample at m/z 193.0718 and in sample that compound was detected at m/z 193.0720 and calculate for $C_7H_{14}O_6$. The optimum extraction condition was ethanol of 90 % (v/v), acetone of 60 % (v/v), extraction temperature of 80 $^{\circ}$ C and deionized water of 3 ml. Under these conditions, the highest amount of 0.51g total L-Quebrachitol extracted.

Keywords: L-Quebrachitol, Ethanol & Acetone concentration, Deionized water, Temperature, IR spectrum, LCMS analysis