

Intisari

Kandungan getah (*gum*) dalam minyak biji karet dapat mengurangi kualitas biodiesel biji karet dengan meningkatnya residu karbon karena tidak dilakukan proses *degumming*. Penelitian ini dilakukan dengan tujuan untuk mengurangi kandungan getah di dalam biji karet, yaitu dengan menambahkan arang karbon aktif ke dalam proses *in situ* esterifikasi.

Eksperimen penelitian dilakukan secara *batch* di laboratorium. Desain eksperimen dengan *response surface methodology*, *central composite design* diterapkan untuk mendapatkan hasil yang optimum, yaitu *yield* maksimum tetapi bilangan asam rendah. Hasil *in situ* esterifikasi yang optimum tersebut diuji kandungan sedimennya. Selanjutnya, kandungan sedimen hasil *in situ* esterifikasi dengan penambahan arang aktif dibandingkan terhadap hasil yang tanpa penambahan arang aktif.

Uji sedimentasi menunjukkan bahwa kandungan sedimentasi tanpa ditambahkan arang karbon aktif ke dalam proses *in situ* esterifikasi sebesar 0,8748 wt.%, sedangkan dengan penambahan arang karbon aktif ke dalam proses *in situ* esterifikasi kandungan sedimentasi sebesar 0,5991 wt.%. Kondisi optimum kandungan biodiesel biji karet diperoleh sebesar 81,36 wt.% dan bilangan asam sebesar 0,5009 mg KOH/g. Hasil ini diperoleh pada kondisi rasio perbandingan volume metanol terhadap volume n-heksana sebesar 1,325 mL/mL, waktu reaksi *in situ* esterifikasi selama 0,5 jam, massa arang aktif sebesar 0,403 g, dan jumlah katalis HCl sebesar 7,651 wt.%.

Kata kunci: biodiesel, esterifikasi, *degumming*, *yield*, bilangan asam, kandungan sedimen.

Abstract

The gum content in rubber seed oil can reduce the quality of rubber seed biodiesel by increasing carbon residue, because the degumming process is not carried out. This research was conducted with the aim of reducing the gum content in rubber seed oil, namely by adding activated carbon charcoal to the in situ esterification process.

Research experiments were carried out in batches in the laboratory. The experimental design uses the response surface methodology, a central composite design is applied to get optimal results, which is the largest yield but the amount of acid is low. Optimal in situ esterification results were tested for sediment content. Furthermore, the in situ esterification sediment content with the addition of activated charcoal was compared with the results without the addition of activated charcoal.

Sedimentation test showed that the sedimentation content without added activated carbon charcoal into the in situ esterification process was 0.8748 wt.%, While the addition of activated carbon charcoal into the in situ esterification process sedimentation content was 0.5991 wt.%. The optimum conditions for the biodiesel oil content were 81.36 wt.% And the acid number was 0.5009 mg KOH / g. These results were obtained under conditions of ratio of methanol volume to n-hexane volume of 1.325 mL / mL, the esterification process time is 0.5 hours, mass of activated charcoal by 0.403 g, and the amount of HCl catalyst amounted to 7.651 wt.%.

Keywords: biodiesel, esterification, degumming, yield, acid number, sediment content.