

**OPTIMASI PEMBUATAN NANOEMULSI ASAP CAIR DENGAN  
METODE RESPON PERMUKAAN DAN UJI DAYA HAMBAT  
TERHADAP JAMUR *Aspergillus sp.***

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**INTISARI**

Optimasi pembuatan nanoemulsi asap cair sebagai bahan anti jamur telah dilakukan dengan *Response Surface Methodology* (RSM). Tujuan dari penelitian ini yaitu mengetahui nilai optimum pembuatan nanoemulsi asap cair dengan metode respon permukaan dan mengetahui aktivitas uji daya hambat nanoemulsi asap cair terhadap jamur *Aspergillus sp.* Desain eksperimen *Central Composite Design* (CCD) menggunakan tiga variabel bebas yakni volume surfaktan ( $X_1$ ), waktu pengadukan ( $X_2$ ) dan kecepatan pengadukan ( $X_3$ ). Penerapan RSM dengan tiga variabel memberikan perlakuan sebanyak 20 sampel. Setiap sampel nanoemulsi dibuat sesuai desain eksperimen yang telah ditentukan. Pengujian karakterisasi sifat fisik nanoemulsi dilakukan dengan pengujian organoleptis, sentrifugasi, pH, turbiditas, viskositas dan ukuran partikel.

Hasil penelitian menunjukkan desain tiga faktorial menggunakan RSM dapat menentukan kondisi optimum untuk mendapatkan formula nanoemulsi asap cair dibutuhkan surfaktan 6,68 mL, waktu pengadukan 12,5 menit dan kecepatan pengadukan 1500 rpm. Uji daya hambat terhadap jamur ada beberapa sampel yang nampak memiliki zona hambat tetapi secara keseluruhan dinyatakan belum efektif.

Kata kunci: anti jamur, asap cair, nanoemulsi, *Response Surface Methodology*, *Central Composite Design*

**OPTIMAZATION OF LIQUID SMOKE NANOEMULSION USING  
RESPONSE SURFACE METHODOLOGY AND OBSTACLES TEST ON  
FUNGUS *Aspergillus sp.***

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**ABSTRACT**

The optimization of liquid smoke nanoemulsion as an anti-fungal agent has been carried out using Response Surface Methodology (RSM). The purpose of this study was to determine the optimum value for the manufacture of liquid smoke nanoemulsion by response surface methodology and to determine the activity of the inhibition test for liquid smoke nanoemulsion against *Aspergillus sp.* The Central Composite Design (CCD) experimental design used three independent variables, namely surfactant volume ( $X_1$ ), stirring time ( $X_2$ ) and stirring speed ( $X_3$ ). The application of RSM with three variables provides treatment of 20 samples. Each nanoemulsion sample was made according to a predetermined experimental design. Testing of the physical characteristics of the nanoemulsion was carried out by organoleptic, centrifugation, pH, turbidity, viscosity and particle size.

The results showed that a three factorial design using RSM could determine the optimum conditions to obtaining a liquid smoke nanoemulsion formula with a composition of 6.68 mL of surfactant, 12.5 min of stirring time and 1500 rpm of stirring speed. The results of the inhibitory test show that there were several samples to have inhibitory zones to minimize the growth of fungi.

Keywords: antifungal, liquid smoke, nanoemulsion, Response Surface Methodology, Central Composite Desgin