



## **MATERIAL CuO/BENTONIT SEBAGAI ANTIBAKTERI *Escherichia coli***

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### **INTISARI**

Sintesis, karakterisasi, dan uji aktivitas antibakteri material CuO/bentonit telah dilakukan. Tujuan dari penelitian ini adalah untuk mempelajari cara mensintesis material CuO/bentonit dan mempelajari aktivitas antibakteri CuO/bentonit terhadap bakteri *Escherichia coli*.

Preparasi diawali dengan perlakuan terhadap bentonit yang dihaluskan dan disaring, kemudian diaktivasi dengan H<sub>2</sub>SO<sub>4</sub> untuk menghasilkan H-bentonit. Sintesis CuO/bentonit dilakukan dengan metode hidrotermal. Produk dikarakterisasi dengan FTIR, XRD dan SEM-EDS. Aktivitas antibakteri produk diuji dengan metode *Agar Diffusion Test*.

Hasil penelitian menunjukkan jika CuO/bentonit telah berhasil terbentuk yang dikonfirmasi oleh difraktogram XRD dengan keberadaan puncak pada  $2\theta = 35,10, 38,34, \text{ dan } 40,07^\circ$ . Citra SEM menunjukkan bahwa modifikasi bentonit menjadi CuO/bentonit menyebabkan perubahan pada permukaan bentonit. Data EDX menunjukkan munculnya kandungan Cu di dalam CuO/bentonit sebesar 19,50% (b/b). Hasil uji antibakteri menunjukkan bahwa bentonit, CuO/bentonit, dan CuO memiliki aktivitas antibakteri. CuO/bentonit memiliki diameter daya hambat paling luas dibandingkan dengan bentonit, H/bentonit, dan CuO/bentonit.

Kata kunci : CuO/bentonit, bentonit, antibakteri, *Escherichia coli*



**MATERIAL OF CuO/BENTONITE AS AN ANTIBACTERIAL OF  
*Escherichia coli***

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**ABSTRACT**

The synthesis, characterization, and antibacterial activity test of material based CuO/bentonite has been conducted. The purposes of this research were to study the method of synthesis and characterization of CuO/bentonite material and to study antibacterial activity of CuO/bentonite material towards *Escherichia coli* bacteria.

The preparation was initiated with crushing and sieving bentonite to 100 mesh, then activated it with H<sub>2</sub>SO<sub>4</sub> 1 M to produce H-bentonite material. Synthesis of CuO/bentonite was carried by hydrothermal method. Products were characterized using FTIR, XRD, and SEM-EDX. Antibacterial activity of products were tested using Agar Diffusion Test.

The results of this research showed that CuO/bentonite material has been successfully produced which was confirmed by XRD diffractogram with the appearance of peaks on  $2\theta = 35.10^\circ$ ,  $38.34^\circ$ , and  $40.07^\circ$ . SEM image showed that modification of bentonite to CuO/bentonite resulted the change of bentonite surface. Data of EDX showed the appearance of Cu in the bentonite by 19.50 % wt CuO/bentonite. The result of antibacterial activity showed that all products had antibacterial activity. CuO/bentonite showed the best extent to which bacteria are affected compared with bentonite, H-bentonite, and CuO/bentonite towards *E. coli*.

Keywords : CuO/bentonite, bentonite, antibacterial, *Escherichia coli*