

## **PREPARASI DAN KARAKTERISASI KOMPOSIT (C/K-PROTEIN-FOSFAT) DARI KARBON AKTIF/HIDROLISAT LIMBAH BULU AYAM CV HUMUS**

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### **INTISARI**

Penelitian mengenai preparasi dan karakterisasi komposit karbon aktif/hidrolisat terfosforilasi (C/K-Protein-Fosfat) dari limbah bulu ayam hasil proses karbonisasi hidrotermal milik CV Humus telah dilakukan. Penelitian ini dilakukan dengan tujuan untuk mengetahui karakterisasi hasil preparasi komposit C/K-Protein-Fosfat menggunakan FTIR, mengetahui pengaruh pH hidrolisat dan interaksinya dengan karbon aktif terhadap kemampuan daya serap air (*swelling*) komposit C/K-Protein-Fosfat, serta mempelajari perilaku logam Fe, K, dan Ca pada hidrolisat dan komposit C/K-Protein-Fosfat dalam berbagai pH.

Komposit C/K-Protein-Fosfat yang telah berhasil dibuat dianalisis kemampuan daya serap airnya (*swelling*), analisis FTIR untuk mengetahui gugus fungsi dalam komposit. Analisis XRD untuk mengetahui jenis logam serta logam oksida yang terdapat dalam komposit C/K-Protein-Fosfat. Kemudian dilakukan pula destruksi pada komposit C/K-Protein-Fosfat untuk kemudian dianalisis menggunakan AAS. Adapun filtrat hidrolisat hasil proses preparasi dianalisis kandungan logamnya menggunakan AAS.

Hasil penelitian menunjukkan bahwa komposit C/K-Protein-Fosfat telah terbentuk. Hal ini ditandai dengan munculnya serapan pada bilangan gelombang  $3500\text{ cm}^{-1}$  dan  $1630\text{ cm}^{-1}$  yang merupakan serapan untuk gugus -NH dan C=O amida. Kemampuan daya serap air (*swelling*) komposit C/K-Protein-Fosfat mengalami peningkatan dibandingkan daya serap air karbon aktif tanpa hidrolisat. Nilai daya serap air komposit C/K-Protein-Fosfat optimum berada pada pH 7 yakni sebesar 192,4%. Hasil AAS tidak menunjukkan adanya pengaruh pH terhadap konsentrasi logam. Hasil karakterisasi XRD menunjukkan keberadaan silika tetapi tidak menunjukkan adanya kandungan logam  $\text{Fe}_3\text{O}_4$ ,  $\text{K}_2\text{O}$ , dan  $\text{CaO}$  pada komposit C/K-Protein-Fosfat.

Kata kunci: bulu ayam, fosfat, hidrolisat, karbon aktif, komposit.

***PREPARATION AND CHARACTERIZATION OF COMPOSITE (C/K-  
PROTEIN-PHOSPHATE) FROM ACTIVE CARBON/HYDROLYZATE WASTE  
CHICKEN FEATHER OWNED BY CV HUMUS***

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**ABSTRACT**

Research on the preparation and characterization of phosphorylated activated carbon/hydrolysate (C/K-Protein-Phosphate) composites from chicken feather waste resulting from the hydrothermal carbonization process has been carried out. The aim of this research was to characterize the C/K-Protein-Phosphate composite using FTIR, knowing the effect of hydrolysate pH and its interaction with activated carbon on the ability of water absorption (swelling) of C/K-Protein-Phosphate composites, and studying the behavior of the C/K-Protein-Phosphate composite. Fe, K, and Ca metals on hydrolysates and C/K-Protein-Phosphate composites in various pHs.

The C/K-Protein-Phosphate composites that have been successfully fabricated were analyzed for their swelling, FTIR, and XRD analysis to determine the swelling ability, the types of functional groups and the types of metals and metal oxides contained in the C/K-Protein-Phosphate composite, respectively. The metal content of the composites was analyzed using AAS.

The results showed that the C/K-Protein-Phosphate composite was successfully synthesized. This is indicated by the appearance of absorption at wave numbers of  $3500\text{cm}^{-1}$  and  $1630\text{cm}^{-1}$  which is absorption for the -NH and C=O amide groups. The swelling ability of C/K-Protein-Phosphate composite was higher than that of activated carbon without hydrolysate. The water absorption value of the C/K-Protein-Phosphate composite at optimum condition was at pH 7, which was 192.4%. The metal content analysis did not show any effect of pH on metal concentrations. The diffraction of the C/K-Protein-Phosphate composite showed the appearance silica in the composite. On the contrary, the XRD results did not show the presence of  $\text{Fe}_3\text{O}_4$ ,  $\text{K}_2\text{O}$ , and  $\text{CaO}$  in the C/K-Protein-Phosphate composite.

**Keywords:** activated carbon, chicken feather, composite, hydrolysate, phosphate.



**PREPARASI DAN KARAKTERISASI KOMPOSIT (C/K-PROTEIN- FOSFAT)DARI KARBON  
AKTIF/HIDROLISAT LIMBAH BULU**

**AYAM CV HUMUS**

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