

## **ANALYSIS OF Na, K, Fe HUMIC ACID AND FULVIC ACID IN LIQUID FRACTION OF HYDROLYSATE FROM CHICKEN FEATHERS**

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### **ABSTRACT**

The Na, K, Fe, humic acid, and fulvic acid contents in the liquid fraction of hydrolysate from chicken feathers were analyzed in this work. The research was proposed to perform qualitative and quantitative analyses of the liquid fraction hydrolysates containing humic acid and fulvic acid.

This research has been carried on by preparing the sample of liquid hydrolysate from CV Humus using the IHSS protocol. The sample that has been prepared was characterized by Atomic Absorption Spectroscopy (AAS) and UV-Vis Spectrophotometry to determine the chemical content. Then, the liquid hydrolysate was modified into the dry matter, and it was analyzed by using Fourier-Transform Infrared (FTIR), Scanning Electron Microscope (SEM), Transmission Electron Microscope (TEM), and X-Ray diffraction (XRD).

The Na, K, and Fe concentrations were found to be 0.42%, 1.72%, and 0.043%, respectively. The XRD data suggests that the dried hydrolysate is an amorphous carbon structure. FT-IR data indicates the presence of humic acid and fulvic acid of IHSS. It shows vibrations of  $\text{-OH}$  ( $3240\text{ cm}^{-1}$ ), aliphatic  $\text{-CH}$  ( $2908\text{ cm}^{-1}$ ,  $2877\text{ cm}^{-1}$ , and  $2854\text{ cm}^{-1}$ ), aldehydes  $\text{C-H}$  ( $2700\text{ cm}^{-1}$ ), carboxylic acid  $\text{C=O}$  ( $1720\text{ cm}^{-1}$ ), aromatic  $\text{C=C}$  ( $1558\text{ cm}^{-1}$ ,  $1450\text{ cm}^{-1}$ ),  $\text{-OH}$  deformation ( $1250\text{ cm}^{-1}$ ) and  $\text{Fe-O}$  ( $586\text{ cm}^{-1}$ ). The TEM and SEM/EDX data indicates that the hydrolysates have paramagnetic particles ( $>20\text{ nm}$ ) and superparamagnetic particles ( $<20\text{ nm}$ ), as well as flat topography and detected corresponding elements.

**Keywords:** fulvic acid, humic acid, hydrothermal, liquid hydrolysates

## **ANALISIS Na, K, Fe FRAKSI CAIR ASAM HUMAT DAN ASAM FULVAT DALAM HIDROLISAT DARI BULU AYAM**

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### **INTISARI**

Kandungan Na, K, Fe, asam humat, dan asam fulvat dalam fraksi cair hidrolisat dari bulu ayam dianalisis dalam penelitian ini. Penelitian ini diusulkan untuk melakukan analisis kualitatif dan kuantitatif dari fraksi cair yang mengandung asam humat dan asam fulvat.

Penelitian ini telah dilakukan dengan mempersiapkan sampel hidrolisat cair dari CV Humus di bawah protokol IHSS. Sampel yang telah disiapkan dikarakterisasi dengan Spektrofotometri AAS dan UV-Vis untuk mengetahui kandungan kimianya. Kemudian, hidrolisat cair termodifikasi ke dalam bahan kering dianalisis menggunakan Fourier-Transform Infrared (FTIR), Scanning Electron Microscope (SEM), Transmission Electron Microscope (TEM), dan difraksi sinar-X (XRD).

Kandungan Na, K, dan Fe masing-masing adalah 0,42%, 1,72%, dan 0,043%. Data XRD menunjukkan bahwa hidrolisat kering berstruktur karbon amorf. Data FT-IR menunjukkan adanya asam humat dan asam fulvat dari IHSS. Menunjukkan vibrasi  $\text{-OH}$  ( $3240\text{ cm}^{-1}$ ),  $\text{-CH}$  alifatik ( $2908\text{ cm}^{-1}$ ,  $2877\text{ cm}^{-1}$ , dan  $2854\text{ cm}^{-1}$ ), aldehida  $\text{C-H}$  ( $2700\text{ cm}^{-1}$ ), asam karboksilat  $\text{C=O}$  ( $1720\text{ cm}^{-1}$ ),  $\text{C=C}$  aromatik ( $1558\text{ cm}^{-1}$ ,  $1450\text{ cm}^{-1}$ ), deformasi  $\text{-OH}$  ( $1250\text{ cm}^{-1}$ ) dan  $\text{Fe-O}$  ( $586\text{ cm}^{-1}$ ). Data TEM dan SEM/EDX menunjukkan bahwa hidrolisat memiliki partikel yang bersifat paramagnetik ( $>20\text{ nm}$ ) dan partikel yang bersifat superparamagnetik ( $<20\text{ nm}$ ), serta topografi datar dan mendeteksi elemen yang sesuai.

Kata kunci: asam fulvat, asam humat, hidrotermal, hidrolisat cair