

Natural Dye Formation of Fe(III)-tannin Complex from *Terminalia catappa* Leaves

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ABSTRACT

Natural dyed textile products are used in traditional fabrics such as batik, woven and other handmade fabrics. Some materials are sources of natural textile dyes to obtain black color as charcoal, clay, and several plant extracts. *Terminalia catappa* extract produces a black color on fabrics processing by iron. The main chemical compound in these plants is secondary metabolite products called tannin.

Tannin is a chemical marker which is the main subject in the formation of the color. The main phenomenon in the formation of black color is the occurrence of a complex reaction between Fe(III) ions and tannin. This is match with the standard concept of identifying tannin in the chemical analysis of natural products, namely the reaction of tannin with FeCl₃ reagents which produces a black color.

Tannin was extracted from *Terminalia catappa* leaves and identified with several supporting instruments. Complex formation of tannin with iron were varied with iron by three precursor (FeSO₄, FeCl₂, FeCl₃). The resulted complex then characterized by Uv-Vis Spectrophotometer, infrared Spectrometer, X-Ray Diffraction and Scanning Electron Microscope-EDX. The application of the color formation was studied by dyeing of cotton fabrics. The result is green to black color according to mordant agent which act as central atom in complex formation with tannin.

Kata Kunci: *complexes, dye, Iron, tannin, Terminalia catappa,*