

**PRODUCTION OF CELLULOSE FROM AGRICULTURAL WASTE USING
NON-WOOD CHEMICAL PULPING METHOD**

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TAJUK PROJEK: PRODUCTION OF CELLULOSE FROM AGRICULTURAL WASTE USING NON-WOOD CHEMICAL PULPING METHOD

Dengan hormatnya perkara di atas adalah dirujuk.

Sukacita dimaklumkan bahawa Mesyuarat Jawatankuasa Penyelidikan pada 29 Oktober 2003 telah membuat keputusan:

- i. Bersetuju meluluskan cadangan penyelidikan yang telah dikemukakan oleh puan dan Puan Atikah Kadri.
- ii. Walaubagaimanapun, kelulusan ini adalah bersyarat di mana puan diminta untuk membuat pindaan pada keperluan kewangan di mana Samples Testing di para e) Lain-lain: perlu dipindahkan ke para d) upah. Adalah juga dicadangkan pihak puan menggunakan peralatan di UiTM Cawangan Pahang.
- iii. Tempoh projek penyelidikan ini ialah **12 bulan**, iaitu bermula **1 November 2003** hingga **31 Oktober 2004**.
- iv. Kos yang diluluskan ialah sebanyak **RM 50,000.00** sahaja dari Geran MOE. Penggunaan geran yang diluluskan hanya akan diproses setelah perjanjian ditandatangani.
- v. Puan perlu membelanjakan **50%** daripada geran penyelidikan yang telah diluluskan bagi projek puan dalam tempoh **6 bulan** pertama projek berjalan. Sehubungan itu, pihak IRDC akan memantau penggunaan geran penyelidikan puan untuk memastikan **50%** daripada jumlah geran yang diluluskan telah dibelanjakan sehingga bulan **April 2004**.
- vi. Semua pembelian peralatan yang kosnya melebihi **RM 500.00** satu item perlu menggunakan Pesanan Jabatan Universiti Teknologi MARA (LO). Pihak puan juga dikehendaki mematuhi peraturan penerimaan peralatan. Panduan penerimaan peralatan baru dan pengurusannya, dilampirkan.
- vii. Semua peralatan/kelengkapan penyelidikan yang dibeli adalah menjadi hak milik fakulti. Semua peralatan/kelengkapan hendaklah diserahkan kepada pihak fakulti setelah tamat penyelidikan untuk kegunaan bersama.

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ABSTRACT

Agriculture industry is one of the main industries in Malaysia. This industry has generated large amounts of agrowastes every year, such as banana stem, rice straw, sugarcane bagasse etc. These are regarded as abundant, inexpensive and readily available natural resources for pulping industry. This paper deals with the study of the pulping potentialities of banana stems grown in Malaysia. Banana stems are used as raw material in pulping process to produce cellulose as pulp. The chemical pulping method used in this study is soda pulping, where NaOH is the main chemical used in cooking. Temperature, residence time and dosage of chemical used are the parameters to be manipulated in this non-wood chemical pulping process to get an optimum condition for pulping. A batch reactor was used in this non-wood chemical pulping process. The concentration of NaOH used was varied from 10 – 45% and cooking was at temperatures of 100 - 200°C. The ratio of solid to liquid is set at 1:3 and also the cooking period was varied from 30 - 210 min. The result shows that the optimum yield of cellulose from this study is at 25%w/w NaOH, cooking at 160°C and for 90 minutes. The yield of pulp is around 30% which is similar to that obtained from oil-palm frond-fiber (Rosli et. al. 2004). The cellulose content from the pulp produced is high which around 90%. The mechanical strength is tested for the paper made from the pulp produced and found that the tensile index is about 41.8 kNm/g, the tear index is 7.38 mNm²/g and the bursting index is 3.27 kPam²/g. This is comparable to paper Cordeiro et. al. 2004 which used banana pseudo-stem growing in Madeira Island (Portugal) as raw material.

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