

## INTISARI

Telah dibuat adsorben karbon aktif tempurung kemiri melalui proses pirolisis dan aktivasi menggunakan gas  $\text{CO}_2$  dan dipelajari kemampuan adsorpsinya terhadap khrom dalam limbah cair industri penyamakan kulit. Penelitian ini bertujuan mempelajari (a) pembuatan karbon aktif dari tempurung kemiri, (b) kemampuan adsorpsi karbon aktif tempurung kemiri terhadap khrom dalam limbah cair industri penyamakan kulit, dan (c) pengaruh waktu kontak, konsentrasi awal dan pH larutan terhadap jumlah khrom teradsorpsi pada karbon aktif tempurung kemiri.

Tempurung biji kemiri dipirolisis selama 1,5 jam pada suhu yang divariasikan antara 300 hingga  $600^\circ\text{C}$ . Arang yang diperoleh diaktivasi dengan cara dialiri gas  $\text{CO}_2$  pada suhu antara 550 hingga  $850^\circ\text{C}$  selama 2,5 jam. Uji kemampuan adsorpsi adsorben terhadap khrom dilakukan dengan menggunakan sistem batch. Penentuan nilai kapasitas dan afinitas adsorpsi dilakukan dengan cara merendam 2% karbon aktif tempurung kemiri ke dalam 50 ml limbah khrom pada berbagai konsentrasi awal dengan waktu kontak 12 jam. Teknik Spektrofotometri Serapan Atom (AAS) digunakan untuk kuantisasi ion logam dalam limbah. Jumlah khrom yang teradsorpsi dihitung dari selisih konsentrasi khrom sebelum dan setelah adsorpsi.

Hasil penelitian menunjukkan bahwa kualitas arang dan karbon aktif yang diperoleh memenuhi SII, daya serap karbon aktif tempurung kemiri terhadap iodin ( $\text{I}_2$ ) adalah 59,64%. Persamaan isoterm adsorpsi Langmuir digunakan untuk menghitung nilai afinitas dan kapasitas adsorpsi dan diperoleh 0,290 dan 62,11. Adsorpsi maksimum karbon aktif tempurung kemiri terhadap khrom dicapai pada konsentrasi awal sekitar 1500 mg/l dengan waktu kontak selama 12 jam. Adsorpsi khrom pada karbon aktif maksimum pada pH 3.

Kata kunci : karbon aktif, tempurung kemiri, adsorpsi, limbah khrom.

## ABSTRACT

Active carbons from candlenut nutmeg shell adsorbent was made by pyrolysis and activation processes, and its ability of adsorption to the chrome metal in the liquid waste of tannery industry. The purposes of this work is studied (a) preparation of active carbons from candlenut nutmeg shell, (b) ability adsorption of active carbons from candlenut nutmeg shell to chrome in the liquid waste of tannery industry, dan (c) effect of contact times, initial concentration and pH of solution to chrome total adsorpted on active carbons from candlenut nutmeg shell.

The candlenut nutmeg shells pyrolyzed for 1.5 hours at variated temperature between 300 to 600°C. The carbon product were activated by flowing inert gas CO<sub>2</sub> at 550 to 850°C for 2.5 hours. Adsorptin test of adsorbent to chrome in the liquid waste of tannery had been done in batch system. The determination of capacities value and affinity adsorption had been done by deeping 2% of active carbons from candlenut nutmeg shell into 50 ml chrome waste at variated of initially concentration with contact times about 12 hours. The Atomic Absorption Spectrophotometric (AAS) technique was used for evaluate the quantity of metal ions in chrome waste. The total amount of chrome adsorbed on the adsorbent were calculated by the difference between the concentration of chrome in the solution before and after adsorption.

The result showed that quality of carbon and active carbons appropriated of SII. The sorption capacities of active carbons from candlenut nutmeg shell to Iodine (I<sub>2</sub>) is 59.64%. Langmuir Isotherm equation was used for calculate affinity and capacities adsorption, give the value 0.290 and 62.11 respectively. The maximum adsorption of active carbons from candlenut nutmeg shell to chrome achieved at initial concentration about 1500 mg/l with contact times during 12 hours. The maximum adsorption of chrome on active carbons due to pH 3.

Key word : Actice carbons, candlenut nutmeg shell, adsorption, chrome waste.