

Adsorpsi dan regenerasi karbon aktif dalam pengolahan air limbah industri farmasi terhadap penurunan kadar chemical oxygen demand (Studi kasus: Penggunaan tempurung kelapa dan batu bara sebagai adsorben dalam pengolahan air limbah PT. Kimia Farma Plant Jakarta) = Activated carbon adsorption and regeneration in pharmaceutical wastewater treatment for chemical oxygen demand reduction (Case study: The use of coconut shell and coal based activated carbon as adsorbent in wastewater treatment of PT. Kimia Farma Plant Jakarta). / Pricilia Duma Laura Sinaga

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Abstrak

ABSTRAK

Inovasi dan perkembangan industri farmasi dapat memberikan dampak buruk bila tidak diiringi dengan pengolahan air limbah yang baik. Penelitian ini dilakukan untuk mengetahui penyisihan COD limbah industri farmasi melalui adsorpsi karbon aktif batu bara dan tempurung kelapa. Percobaan skala laboratorium dilakukan dengan batch adsorpsi untuk menentukan dosis adsorben (10-50 g/L) dan waktu kontak (30-150 menit) optimum. Dari hasil percobaan dan perhitungan isoterm, penyisihan COD optimum dicapai karbon aktif batu bara dan tempurung kelapa dengan dosis 150 dan 600 g/L pada waktu kontak 90 dan 120 menit. Regenerasi dengan NaOH 4% dilakukan 3 kali, di mana efisiensi regenerasi karbon aktif batu bara mencapai 84,6%; 96,0%; dan 97,8% sedangkan tempurung kelapa mencapai 60,5%; 46,0%; dan 46,6%.

ABSTRACT

Innovation and development of pharmaceutical industries may cause bad impact when they are not coupled with a good wastewater treatment. This research was conducted to investigate reduction of COD in pharmaceutical wastewater by coconut shell and coal-based activated carbon adsorption. Laboratory scale experiments were performed using batch adsorption method to determine the optimum dose of adsorbent (10-50 g/L) as well as contact time (30-150 min). Results and isotherms showed that optimum COD reduction was achieved by 150 g/L coal-based AC for 90 min and 600 g/L coconut shell-based AC for 120 min. Regeneration using NaOH 4% was performed 3 times, where the regeneration efficiency were 84,6%-96,0%-97,8% for coal-based AC and 60,5%-46,0%-46,6% for coconut shell-based AC.