

ABSTRAK

PREPARASI DAN KARAKTERISASI FILTER KERAMIK BERPORI UNTUK DAUR ULANG AIR WUDHU

Air wudhu berpotensi untuk dilakukan daur ulang menjadi air bersih karena jumlahnya yang banyak dan memiliki kualitas air yang baik karena tidak mengandung berbagai kontaminan, air ini hanya mengalami kekeruhan akibat kotoran dari tubuh manusia. Filter keramik merupakan sistem pengolahan air yang banyak digunakan di masyarakat. Tanah liat yang bersifat adsorben kuat dapat dijadikan bahan utama pembuatan filter keramik. Penelitian ini bertujuan untuk melihat potensi daya serap filter keramik berpori berbahan dasar tanah liat, pasir, sekam padi dan kaolin dengan komposisi 3 : 1 : 0,9 : 0,1 terhadap zat-zat terlarut dalam limbah air wudhu dengan mengukur nilai COD serta mempelajari karakteristik membran keramik hasil analisis XRD. Filter keramik dengan bahan yang sama dibuat sebanyak tiga buah dengan membentuk dua bak berupa bak bagian dalam dan bak bagian luar. Bak bagian dalam dibuat untuk menampung limbah air wudhu dan bak bagian luar dibuat untuk menampung air hasil filtrasi. Analisis COD dilakukan pada limbah air wudhu sebelum dan sesudah dilakukan proses filtrasi. Berdasarkan hasil penelitian diketahui filter keramik mengandung mineral illit, kristobalit, hematit dan kuarsa. Filter yang dibuat dapat menurunkan nilai COD secara signifikan. Filter keramik 1 dan 2 dapat menurunkan nilai COD 78,9% dan 82,9%, sedangkan limbah air wudhu sebelum dan sesudah filtrasi yang digunakan pada filter keramik 3 mempunyai nilai COD air dibawah limit deteksi sehingga tidak dapat ditentukan perubahan nilai COD yang terjadi.

Kata-kata kunci: filter keramik; air wudhu; adsorpsi; XRD; COD.

ABSTRACT

PREPARATION AND CHARACTERIZATION POROUS CERAMIC FILTER FOR RECYCLING ABLUTION WATER

Ablution water is potential for eventual recycling into clean water because water numbers are overflow and have good quality because it does not contain a variety of contaminants, the ablution water is only got turbidity due to dirt on the parts of human body. Ceramic filter is a water treatment system that is widely used in the community. Clay which is a strong adsorbent can be used the main material of ceramic filter. This research aims to know the potential absorption of porous ceramic filter made by clay, sand, rice bran and kaolin with the composition is 3:1:0,9:0,1 of dissolved substances in waste water ablution by measuring the value of COD and studied the characteristic of ceramic membrane of XRD analysis result. Ceramic filters with the same material are made as much as three pieces by forming two tubs of inner tub and outer tub. The inner tubs is made to accomodate the waster water of ablution water and outer tubs is made to accomodate the water of the filtration. The COD analysis is done on the waste water of ablution before and after the filtration process. Eventually, the results showed that ceramic filter contain mineral illit, cristobalite, hematite and quartz. Ceramic filter can significantly lower the COD value. Decrease of cod value on ceramic filter 1 and 2 looks significant that is 78,9% and 82,9%, while the waster water of ablution before and after filtration used in the ceramic filter 3 has the COD value at the detection limit so that no change of the COD codes can be determined.

Keywords: ceramic filter; ablution water; adsorption; XRD; COD.



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