SUMMARY

PEMANFAATAN LIMBAH CACO3 DARI PABRIK ZA2 UNTUK SUBSTITUSI KAPUR AKTIF PADA UNIT PENGOLAHAN LIMBAH PABRIK III DI PT PETROKIMIA GRESIK

USAGE BY-PRODUCT CALCIUM CARBONATE FROM ZA II PLANT FOR SUBSTITUTION OF ACTIVATED LIME ON EFFLUENT TREATMENT III PT PETROKIMIA GRESIK

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Subject : Limbah, pabrik

Keyword : : Acidic water; Neutralized water; Treated water; kapur aktif ; kapur ZA2 ; kapur mixed

Description :

Acidic water adalah limbah cair dari proses produksi asam fosfat dan purified gypsum dengan karakteristik pH rendah 1 - 2, fosfat tinggi 2500 â€“ 6000 ppm sebagai P2O5 , Fluorida 500 â€“ 1500 ppm sebagai F dan sulfat 1500 â€“ 2500 ppm sebagai SO4. Untuk digunakan sebagai air proses dan memenuhi Baku Mutu Air Limbah Jawa Timur perlu diolah dalam suatu Unit Pengolah Limbah.

Beberapa bahan kimia yang dapat digunakan untuk proses netralisasi dan removal polutan adalah kalsium oksida, kalsium karbonat, aluminium hidroksida dan besi (III) oksida. Bahan kimia yang banyak digunakan adalah kalsium oksida (kapur aktif ,CaO). Penelitian sebelumnya menunjukkan CaCO3 juga efektif digunakan. Kapur CaCO3 dari by-product produksi pupuk ZA memiliki potensi sebagai pengganti kapur aktif.

Dengan latar belakang tersebut maka penelitian bertujuan untuk mengevaluasi penggantian kapur aktif dengan CaCO3. Percobaan skala batch dalam peralatan jar test dan settling column test dengan variasi jenis dan ekses kapur. Evaluasi meliputi kualitas neutralized dan treated water, kecepatan pengendapan sludge, sludge removal dan biaya operasional pengolahan limbah dibandingkan dengan kondisi referen.

Kapur CaCO3 murni tidak efektif untuk pengolahan acidic water karena P2O5 removal rendah (80 - 87 %) namun masih sesuai referensi (> 70 %). Kapur mixed (ekses 37,5 %) dapat menggantikan kapur aktif dengan P2O5 removal = 94 %, F removal = 98 % dan turbiditi produk = 1,2 NTU. Kecepatan pengendapan mencapai 18 m/j sesuai design clarifier minimal 5,4 m/j. Total solid removal lebih baik rata-rata 6,8 % dibandingkan referen. Biaya operasional pengolahan limbah menjadi Rp 6 per liter, turun sebesar 29,5 % dibandingkan blanko (Rp 8,4 per liter) dan 57,7 % dibandingkan referen (Rp 14 per liter).

Description Alt:

Acidic water is waste water from phosphoric acid and purified gypsum which has low pH, high phosphate, high fluoride and high sulphate characteristics. The waste must be treated before recycled as process water or send as waste water according to East Java Government Regulation (BMAL Jawa Timur).

Many chemicals are used for neutralization and pollutant removal from acidic water such as activated lime (CaO), ground calcium carbonate (CaCO3), aluminium hydroxide (Al(OH)3) and iron (III) oxide. Activated lime is widely used in acidic waste water treatment plants. Some previous works show that ground calcium carbonate as good as activated lime for the treatment with favour.

On the other hands, there are abundance source of calcium carbonate as by-product of ZA plant (600 â€“ 800 metric ton daily). Some environmental and operational problems occur according to the abundance of the by-product.

This work tries to evaluate the possibility of usage of chalk cake from ZA to substitute the activated lime. Some objective parameter must be evaluated to compare with the reference such as qualities of neutralized and treated water, settling velocity, total solid removal and cost of operational. Works has been done in laboratory scale by a jar test and settling column test apparatus. The evaluated variables are kind and excess of lime.

Pure CaCO3 is not effective for acidic water treatment because the lower phosphate removal (80-87 %). While the

mixed chalk (37.5 % excess) can effectively use on acidic water treatment with good performances such as phosphate removal up to 94 %, fluoride removal up to 98 % and turbidity 1.2 NTU. Settling velocity is 18 m/h lower blank (21 m/h) but comply with clarifier design (min. 5.4 m/h). Total Solid Removal is 6.8 % better in average than blank condition. Operational cost is became Rp 6 per litre, decreased up to 29.5 % compare to blank (Rp 8.4 per litre) and 57.7 % to reference (Rp 14 per litre) of treated acidic water.

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Thank You,

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