

PENURUNAN KADAR KESADAHAN TOTAL SUMBER MATA AIR PEGUNUNGAN KENDENG PATI MENGGUNAKAN ZEOLIT ZSM-5 BERDASARKAN VARIASI LAMA PERENDAMAN

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ABSTRAK

Air Pegunungan Kendeng Pati memiliki kandungan kapur yang tinggi. Akibat tingginya kandungan kapur sehingga menyebabkan kadar kesadahan total menjadi tinggi. Kesadahan total memiliki dampak yang merugikan bagi manusia, bisa menyebabkan penyakit batu ginjal, air menjadi keruh. Oleh karena itu diperlukan suatu solusi untuk menurunkan kadar kesadahan total, salah satunya menggunakan zeolit sintetis ZSM-5. Penelitian ini bertujuan untuk mengetahui pengaruh penggunaan zeolit ZSM-5 terhadap penurunan kadar kesadahan total sumber mata air pegunungan Kendeng Pati berdasarkan variasi lama perendaman 60, 90, 120, 150, dan 180 menit. Jenis penelitian ini bersifat eksperimen, metode yang digunakan adalah metode titrasi kompleksometri. Hasil penelitian menunjukkan kadar kesadahan total awal sebesar 410 mg/L, kemudian terjadi penurunan kadar kesadahan total setelah direndam menggunakan zeolit ZSM-5 0,75 %b/v berturut-turut yaitu $45,08 \pm 0,05$; $51,58 \pm 0,12$; $61,54 \pm 0,11$; $70,00 \pm 0,21$; dan $80,40 \pm 0,11$ %. Penurunan kadar kesadahan total tertinggi terjadi pada waktu perendaman 180 menit. Kemudian dilakukan uji statistik One Way Anova, hal ini menunjukkan bahwa ada pengaruh variasi lama perendaman terhadap penurunan kadar kesadahan total sumber mata air pegunungan Kendeng Pati dengan penambahan zeolit ZSM-5 0,75 %b/v.

Kata kunci : Kesadahan Total, Air Pegunungan Kendeng, Zeolit ZSM-5

DECREASING IN THE TOTAL HARDNESS OF THE SPRINGS OF KENDENG PATI MOUNTAINS USING ZSM-5 ZEOLITE BASED ON VARIATION IN IMMERSION TIME

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ABSTRACT

Kendeng Pati Mountain Water has high lime content. As a result of the high content of lime which causes the total hardness to be high. Total hardness has a detrimental effect on humans, can cause kidney stone disease, water becomes cloudy. Therefore, a solution is needed to reduce the total hardness level, one of them is using ZSM-5 synthetic zeolite. This study aims to determine the effect of ZSM-5 zeolite use on the reduction of the total hardness level of the Kendeng Pati mountain spring water source based on the variance of 60, 90, 120, 150 and 180 minutes of soaking time. This type of research is experimental, the method used is complexometry titration method. The results showed that the initial total hardness level was 410 mg / L, then there was a decrease in the total hardness level after immersion using ZSM-5 zeolite 0.75% b / v, respectively 45.08 ± 0.05 ; 51.58 ± 0.12 ; 61.54 ± 0.11 ; 70.00 ± 0.21 ; and $80.40 \pm 0.11\%$. The highest decrease in total hardness occurs at 180 minutes soaking time. Then the One Way Annova statistical test was carried out, it showed that there was an effect of variations in immersion length on the decrease in the total hardness of the Kendeng Pati mountain spring with the addition of ZSM-5 zeolite 0.75% w / v.

Keywords: Total Hardness, Kendeng Mountain Water, ZSM-5 Zeolite