

ABSTRAK

Telah dilakukan penelitian untuk mengetahui kadar logam (Ca, Fe, Mg, Mn, Zn) dalam sampel air limbah pengrajin perhiasan imitasi skala rakyat di desa Karangrejo, Tulungagung (AL) dan air sumur pengrajin (AS₁ kira-kira 3 m dari sumber limbah), serta air sumur penduduk dengan berbagai jarak sumur dari sumber limbah (AS₂ kira-kira 25 m, AS₃ kira-kira 50 m, AS₄ kira-kira 75 m, AS₅ kira-kira 100 m) dengan menggunakan alat ICPS.

Dari hasil uji kualitatif, sampel AL mengandung 8 logam (Al, Ca, Cu, Fe, Mg, Mn, Ni, Zn), dan sampel AS₁-AS₅ mengandung 5 logam (Ca, Fe, Mg, Mn, Zn). Oleh karena itu penelitian ini hanya difokuskan pada 5 logam tersebut. Dari hasil uji kuantitatif dapat disimpulkan bahwa kadar logam-logam dalam sampel berbeda-beda, dan yang melebihi batas normal yang ditetapkan pemerintah pada sampel AL: Fe ($1,285 \pm 0,088$ mg/L) > 1,0 mg/L, sampel air sumur = Fe (AS₁ = $0,718 \pm 0,122$ mg/L, AS₂ = $0,139 \pm 0,017$ mg/L, AS₃ = $0,052 \pm 0,008$ mg/L, AS₅ = $0,371 \pm 0,052$ mg/L) > 0,03 mg/L, dan Mn (AS₁ = $0,463 \pm 0,001$ mg/L, AS₅ = $0,198 \pm 0,608$ mg/L) > 0,1 mg/L.

Dari hasil ANAVA ($\alpha=0,05$), terdapat perbedaan bermakna antar sampel air sumur (AS₁-AS₅) terhadap kadar logam: Ca, Mg; Fe (kecuali: AS₂ dengan AS₃, AS₃ dengan AS₄), dan Mn (kecuali: AS₃ dengan AS₄); dan dari hasil uji regresi dan korelasi menunjukkan bahwa peningkatan jarak sumur (kira-kira 3-100 m) dari sumber limbah tidak berpengaruh terhadap kadar logam-logam tersebut.

ABSTRACT

An experiment has been conducted to find out concentration of metals (Ca, Fe, Mg, Mn, Zn) in wastewater sample from the welder of imitation jewelry in Karangrejo's village, Tulungagung (AL), and well water of the welder (AS₁ approximately 3 m from the centre of wastewater area), and well water of people who live near by the centre of wastewater area (AS₂ approximately 25 m, AS₃ approximately 50 m, AS₄ approximately 75 m, AS₅ approximately 100 m) by using ICPS equipment.

From the qualitative analysis, AL sample contained 8 metals (Al, Ca, Cu, Fe, Mg, Mn, Ni, Zn), and AS₁-AS₅ sample contained 5 metals (Ca, Fe, Mg, Mn, Zn). Therefore this experiment is focused on those 5 metals. From the quantitative analysis it can be concluded that concentration of metals in samples were different and it is higher than normal limit of government regulations, namely for AL sample: Fe ($1,285 \pm 0,088$ mg/L) > 1,0 mg/L, samples of well water = Fe (AS₁ = $0,718 \pm 0,122$ mg/L, AS₂ = $0,139 \pm 0,017$ mg/L, AS₃ = $0,052 \pm 0,008$ mg/L, AS₅ = $0,371 \pm 0,052$ mg/L) > 0,03 mg/L, and Mn (AS₁ = $0,463 \pm 0,001$ mg/L, AS₅ = $0,198 \pm 0,608$ mg/L) > 0,1 mg/L.

From the ANAVA ($\alpha=0,05$), it is found out that there is a functional difference between samples of well water (AS₁-AS₅) and the concentration of metals: Ca, Mg; Fe (except: AS₂ with AS₃, AS₃ with AS₄), and Mn (except: AS₃ with AS₄); and from the regression and correlation analysis, the increasing of well distance (approximately 3-100 m) from wastewater area does not certainly affect the concentration of those metals.