

**PENGARUH VARIASI KOMBINASI MEDIA FILTER ZERA (ZEOLIT DAN
KARBON AKTIF) TERHADAP PENURUNAN KADAR BESI (Fe) , MANGAN
(Mn) DAN KEKERUHAN DALAM AIR SUMUR**

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ABSTRAK

Latar Belakang : Air sumur di Bantul masih banyak yang mengandung besi (Fe), mangan (Mn), dan kekeruhan melebihi ambang batas, sehingga berisiko bagi kesehatan masyarakat. Filtrasi menggunakan kombinasi media zeolit dan karbon aktif (filter zera) merupakan salah satu metode pengolahan sederhana yang efektif.

Tujuan : Mengetahui pengaruh variasi kombinasi media filter zera terhadap penurunan kadar Fe, Mn, dan kekeruhan pada air sumur.

Metode Penelitian : Penelitian ini merupakan **quasi experiment** dengan desain pre-test–post-test. Tiga kombinasi media filter diuji: A (zeolit 30 cm + karbon aktif 30 cm), B (zeolit 20 cm + karbon aktif 40 cm), dan C (zeolit 40 cm + karbon aktif 20 cm). Pengukuran kadar Fe, Mn, dan kekeruhan dilakukan sebelum dan sesudah filtrasi.

Hasil : Seluruh kombinasi filter menurunkan kadar Fe, kombinasi A (92,34%), kombinasi B (94,59%), Kombinasi C (90,09%), Kadar Mn kombinasi A (100%), kombinasi B (95,89%), kombinasi C (90,41%) dan kekeruhan kombinasi A (94,22%), kombinasi B (96,97), kombinasi C (91,48%). Namun, secara statistik tidak terdapat pengaruh signifikan variasi ketebalan media terhadap penurunan Fe ($p=0,550$), Mn ($p=0,962$), dan kekeruhan ($p=0,329$). Kombinasi B menunjukkan hasil penurunan paling optimal.

Kesimpulan : Filter zera (zeolit–karbon aktif) efektif dalam menurunkan kandungan Fe, Mn, dan kekeruhan pada air sumur, namun variasi ketebalan media tidak memberikan pengaruh signifikan secara statistik.

Kata Kunci : filter zera, zeolit, karbon aktif, Fe, Mn, kekeruhan, air sumur

**“THE EFFECT OF VARIATIONS IN ZERA FILTER MEDIA COMBINATIONS
(ZEOLITE AND ACTIVATED CARBON) ON THE REDUCTION OF IRON (FE),
MANGANESE (MN), AND TURBIDITY IN WELL WATE”**

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ABSTRACT

Background: Groundwater in Bantul often contains excessive levels of iron (Fe), manganese (Mn), and turbidity, exceeding quality standards and posing health risks. Filtration using zeolite and activated carbon (zera filter) is a simple and effective water treatment method.

Objective: To assess the effect of different zera filter media combinations on reducing Fe, Mn, and turbidity in well water.

Research Method: A **quasi-experimental study** with a pre-test–post-test design was conducted. Three filter combinations were tested: A (zeolite 30 cm + activated carbon 30 cm), B (zeolite 20 cm + activated carbon 40 cm), and C (zeolite 40 cm + activated carbon 20 cm). Well water samples were analyzed for Fe, Mn, and turbidity before and after filtration.

Results: All filter combinations effectively reduced Fe levels: combination A (92.34%), combination B (94.59%), and combination C (90.09%); Mn levels: combination A (100%), combination B (95.89%), and combination C (90.41%); as well as turbidity: combination A (94.22%), combination B (96.97%), and combination C (91.48%). However, statistical analysis showed no significant differences among media thickness variations for Fe ($p=0.550$), Mn ($p=0.962$), and turbidity ($p=0.329$). Combination B achieved the most effective reduction.

Conclusion: The zera filter (zeolite–activated carbon) was effective in reducing Fe, Mn, and turbidity levels in well water. However, differences in media thickness did not have a statistically significant effect.

Keywords : zera filter, zeolite, activated carbon, Fe, Mn, turbidity, groundwater

