

**DEGRADASI RESIDU PESTISIDA CHERIZEB DAN EMACEL PADA
AIR CUCIAN CABAI MENGGUNAKAN KATALIS CuO /ZEOLIT
SECARA FOTOLISIS**

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UNIVERSITAS ANDALAS

PADANG

2025

ABSTRACT
PHOTOLYTIC DEGRADATION OF CHERIZEB AND EMACEL PESTICIDE RESIDUES IN CHILI WASHING WATER USING A CuO/ZEOLITE CATALYST

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Chili (*Capsicum annum* L.) is one of Indonesia's leading horticultural commodities, playing an important role in both culinary culture and the national economy. The high incidence of pests and diseases in chili plants often drives farmers to repeatedly use synthetic pesticides, sometimes even mixing several types at once, such as Cherizeb and Emacel. Although effective in controlling pests, such practices leave pesticide residues that are difficult to remove through conventional methods such as washing or heating. These residues have the potential to cause toxic effects on human health and pollute the environment. This study aims to degrade pesticide residues in chili wash water using the photolysis method with a CuO/zeolite catalyst. The results showed that without a catalyst, the percentage of pesticide degradation remained very low—8.19% for Cherizeb (60 minutes) and 6.61% for Emacel (75 minutes). The use of CuO (0.0308 g) increased degradation to 71.46% for Cherizeb and 62.01% for Emacel, while zeolite (0.7692 g) achieved 42.26% and 38.71% degradation for Cherizeb and Emacel, respectively. The highest efficiency was obtained with a CuO/zeolite combination of 0.8 g, reaching 82.42% degradation for Cherizeb at 60 minutes and 71.18% for Emacel at 75 minutes. FTIR analysis of chili wash water samples before and after degradation showed shifts in wavenumbers, indicating the occurrence of degradation. Characterization of the CuO/zeolite catalyst using FTIR and XRD revealed no structural changes, confirming that the CuO/zeolite catalyst remained stable and could be reused.

Keywords: *Chili, pesticide residues, photolysis, CuO/Zeolite*

