DEGRADASI RESIDU PESTISIDA CHERIZEB DAN EMACEL PADA AIR CUCIAN CABAI MENGGUNAKAN KATALIS TiO_2/ZEOLIT SECARA FOTOLISIS

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ABSTRACT

PHOTOLYSIS DEGRADATION OF CHERIZEB AND EMACEL PESTICIDE RESIDUES IN CHILI WASH WATER USING A TIO2/ZEOLIT CATALYST

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Chili *(Capsicum annuum L.)* is one of the most important horticultural commodities in Indonesia with high economic value, and therefore its cultivation is carried out intensively. To maintain the quality and productivity of chili plants and to protect them from pests and diseases, farmers generally apply pesticides in relatively high amounts. The types of pesticides commonly applied simultaneously to chili are Cherizeb (active ingredient mancozeb) and Emacel (active ingredient emamectin benzoate). However, excessive application may leave pesticide residues that are harmful to human health and the environment due to their toxic nature and persistence in natural conditions. Therefore, an effective, environmentally friendly, and sustainable method is required to eliminate pesticide residue. One possible solution to degrade these compounds through photocatalysis with TiO_2 supported by zeolite (TiO_2/zeolite) can be used as a catalyst. This study aimed to degrade pesticide residues in chili wash water using TiO_2/zeolite as a photocatalyst under UV lamp. The results showed that degradation without catalyst produced low percentages, namely 12.4 % (cherizeb) and 8.73 % (emacel). After adding a catalyst, degradation percentage reached 93.38% for Cherizeb and 90.22% for Emacel. FTIR analysis of chili wash water samples before and after degradation indicated shifts in wavenumbers, confirming the occurrence of degradation. Characterization of TiO_2/zeolite using XRD before and after degradation showed no structural changes, proving that TiO_2/zeolite can be applied as an effective catalyst in degrading pesticide residues.

Keywords: *Degradation, Photolysis, TiO_2/Zeolite, Cherizeb, Emacel, Chili*