



Low Cost Treatment of Pesticide Wastewater

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Abstract: Raw Azraq bentonite (AB), lime (CaO), and commercial powder activated carbon (PAC) were used for the treatment of pesticide wastewater (PW) discharged by MOBEDCO, Jordan. The treatment efficiencies of the three materials were evaluated by removing 9 different residual pesticides (RPs), turbidity, TSS, non-specific organic compounds (measured as BOD₅ and COD), NH₃, and NH₄⁺ from the PW. Jar Test results showed that AB removed 68-94% of the RPs, 75% of COD, 34% of BOD₅, 94% of NH₃, and 93% of NH₄⁺ from PW. Lime removed 55-85% of the RPs, 74% of COD, 20% of BOD₅, 88% of NH₃, and 85% NH₄⁺ from PW. Finally, PAC removed 67-97% of the RPs, 76% of COD, 35% of BOD₅, 91% of NH₃, and 94% of NH₄⁺ from PW. In addition, germination tests were conducted to investigate the impacts of untreated and treated PW on the germination rates of wheat (*Hourani 27*) and barley (*Rum G4*) species after 5 days. These tests are bio-indicators for the toxicity of PW and the efficiencies of the different treatment reagents in treating PW. The germination rates by using untreated PW showed no germination for both wheat and barley. The germination rates by using PAC-treated PW were 100% for wheat and 85% for barley. Moreover, the germination rates by using AB-treated PW was 35% for wheat and 20% for barley, while by using CaO-treated PW the germination rate was 15% for wheat and zero germination for barley. These results confirm the previous results achieved by the Jar Test experiments; PAC is the most efficient reagent in treating PW followed by AB, and CaO. PAC is a highly effective adsorbent for treating PW, but it involves high cost. Thus, the recommended reagent for the treatment of PW discharged by MOBEDCO is AB, since it is locally available and low cost material.

Keywords: Pesticides wastewater; Azraq Bentonite; Lime; Powder activated carbon; Bio-indicators.

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