POTENTIAL OF ORANGE PEEL, SAW DUST AND *Moringa oleifera* SEED IN ADSORPTION OF PLUMBUM AND COBALT FROM WASTEWATER

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ABSTRACT

POTENTIAL OF ORANGE PEEL, SAW DUST AND *Moringa oleifera* SEED IN ADSORPTION OF PLUMBUM AND COBALT FROM WASTEWATER

Plumbum (Pb) and Cobalt (Co) are the common discharge in huge amount by the chemical industries. Due to the negative implications of Pb and Co to human health and environment, researchers opt for adsorption technique which are cheaper and efficient in removing heavy metal. In this study, orange peel, saw dust and *Moringa oleifera* seed are used to remove Pb and Co in wastewater. The adsorption experiment is done by leaving the adsorbent in plumbum nitrate and cobalt (II) chloride solution before analysing using Atomic Absorption Spectrophotometer (AAS). The percentage removal of Pb and Co are calculated. Several factors such as adsorbent dose (0.2, 1.0 and 1.8 g) and temperature (15, 30 and 45 °C) are investigated to see whether they influence the percentage removal of Pb and Co. Experimental result revealed that there is significant difference between temperature and percentage removal of Pb and Co ($p=0.000$) but there is no significant difference between adsorbent dose and percentage removal of Pb and Co adsorbent ($p=0.879$). Ranks of the most effective adsorbent to least effective adsorbent can be constructed in such that saw dust > orange peel > *Moringa oleifera* seed. Saw dust can remove high percentage of Pb and Co because saw dust consists of active ion exchange compound such as crude fiber, acid detergent fiber (containing cellulose and lignin) and hydroxyl groups such as tenins which are responsible for the binding of Pb and Co ions In conclusion, saw dust is considered as the most effective adsorbent because it able to remove 90.73% Pb and 96.92% Co. Further recommendations that can be suggested to improve this study includes increase the adsorbent dose, use sample water from river instead of artificial wastewater, add more parameters such as contact time, pH, initial heavy metal solution concentration and size of particles adsorbent, use standard solution for the preparation of artificial heavy metal solution instead of metal salt dilution and use metal salt in the form of nitrate.