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Impact of Sodium Hydroxide Concentration and Reaction Time on the Modification of Empty Fruit Bunch for Heavy Metal Adsorption

ABSTRACT

The extraction of palm oil from its fresh fruit bunch by-produced at least 89.63 million ton of empty fruit bunch annually and it often ended up in landfill. Thus, it is important to address this issue by finding alternative use for empty fruit bunch such as utilization as adsorbent. The objectives of this work were to identify the most appropriate (i) sodium hydroxide concentration and (ii) reaction time for the modification of empty fruit bunch fiber into low-cost heavy metal adsorbent. The empty fruit bunch fiber was obtained from a local mill, thoroughly cleaned, oven dried, cut into required size, reacted with sodium hydroxide of various concentration and reaction time, rinsed, oven dried and experimented as adsorbent. Results revealed that the most appropriate sodium hydroxide concentration and reaction time for the modification of empty fruit bunch fiber was 0.1 M and 12 h. The adsorbent produced under this optimized modification setting was codenamed as EFBF0.1M 12h and it has the adsorption capacity of 5.14 and 14.31 mg/g for copper (II) and lead (II), respectively.