SLUDGE BASED ADSORBENT

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Sludge is a residue generated from the treatment of wastewater.

Sludge was obtained from the palm oil mill effluent.
Improper handling and disposal of sludge can cause soil contamination.

Common practice through incineration is expensive.

Steep price increase of commercial adsorbent has triggered search for abundantly available precursor.
A promising strategy to overcome the environmental problems arising from sludge disposal.

Synthesis through one-step chemical activation.

Comparable properties with industrial-based activated carbon.

A potential candidate for cheap and renewable adsorbent.
Application: Dye adsorption
Use waste to treat waste approach.

Resolving issues on sludge handling and disposal.

Novel substitute for expensive and non-renewable adsorbent.

Can be used to treat wide spectrum of pollutants in air and water.
Our product design is expected to shed some light to offer solution on sludge handling and disposal.

The price of commercial activated carbon becomes more expensive every year because of increasing demand. This material is widely used in treating wastewater and toxic emissions. Sludge-based adsorbent could be used as potential alternative to commercial activated carbon because of their very similar properties.

Treatment of wide spectrum of pollutants in air and water.

Scale-up unit operations for production and application.
Muhammad Abbas Ahmad Zaini, Mohd. Azizi Che Yunus, Motoi Machida, Yoshimasa Amano, Relationship of helium degassing of cattle-manure-compost adsorbents and copper ions removal, Congress on Engineering and Technology, October 2011, Shanghai, China, 64-67.


Potential customer 1: any factories that produce sludge and encounter problems in dealing with it.

Potential customer 2: any factories that utilize adsorbent for environmental protection.

Potential partners: Kilang sawit Felda Taib Andak, Bukit Batu Brickmills Sdn Bhd.
It is difficult for the industries to invest for new technology, or switch to new alternative unless they are convinced with the product.

Our commercialization approach, for a start, is to ‘donate’ complimentary samples to several identified industries and assist them on the adsorption trials.

For long run, we plan to fabricate a pilot-scale prototype of continuous production to further reduce time consumption and operating costs.

A fabrication of fixed-bed adsorption column employing sludge-based adsorbent for industrial applications.
The global demand of commercial activated carbon is forecasted to be around 5-10% a year, where the steep price increase would also be anticipated.

As far as the economic potential is concern, the cost of production of sludge-based adsorbent is far cheaper than that of commercial activated carbon. Furthermore, the precursor is abundant, renewable and can be obtained at no cost.
Sludge based adsorbent, a promising strategy to overcome environmental problems arising from sludge disposal.

A potential candidate for cheap and renewable adsorbent- comparable properties with industrial-based activated carbon.

‘Use waste to treat waste’.

The product can be used to treat wide spectrum of pollutants in air and water.
Suggested Mechanisms

A → B → C

Legend
(a) Outer surface of carbon
(b) Mesopore channel (2-50nm)
(c) Micropore channel (<2nm)
● Copper ions
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