

Bleaching of crude palm oil

[Science](#), [Chemistry](#)



Bleaching of crude palm oil will be carried out using a mass ratio of 1 synthesized adsorbent to 11 CPO. The CPO in bottle is well shaken before pouring into beaker with an amount of 110 grams. Magnetic stirrer is put into the beaker contains CPO and continuously stirred until it reaches 100 °C. After that, 6 drops of phosphoric acid is added into CPO followed by the addition of 10 grams synthesized adsorbent. The adsorbent must be poured slowly to ensure it mixed well with CPO and prevent numerous bubbles formed.

Then, the mixture is heated until it reaches 150 °C and allows stirring vigorously for an hour until bleaching is completed. Filtration After bleaching is done, the spent adsorbent is separated from the bleached palm oil (BPO) by filtration using filter paper no. 50. Filtration will be carried out in the oven at the temperature of 80 °C for a period of 22 hours. Once the BPO is filtered, the spent adsorbent is collected for regeneration. Soxhlet extraction for adsorbent regeneration Two boiling chips are added into the flat bottom flask and weighed.

Then, hexane is poured into the flat bottom flask until it is half full. Teflon tape is applied on the bottom end of siphon and condenser before fitting the apparatus. This is to prevent the released of hexane gas during the experiment. The wrapped adsorbent is then placed inside the thimble before putting it over the soxhlet extractor for extraction. Vertical condenser is the connected on the upper under of the soxhlet extractor. Two water pipes are connected on the entrance and exit of the condenser for the purpose of cooling the condensate.

The flow rate of water must be adjusted until a smooth flow is seen which adversely means no bubble is suspected over the condenser tube. Hexane is then heated up to the temperature of 200 °C for 6 hours or until all the oil has been extracted. After that, the slurry (oil+ hexane) is dried in the oven at 105 °C for an hour to remove the solvent-hexane. Regeneration of Hexane

The connections between each apparatus are tapped with Teflon tape to prevent hexane gas released during the experiment. The mixture from the previous step is connected to the allihn condenser to remove the hexane from the flat bottom flask.

It is operated at the temperature of 200 °C for about 1-2 hours until hexane is totally removed. Once this process is completed, the separated hexane that collected in the conical flask can be reused. The oil that retained on flat bottom flask is weighted for determination of the collected oil. Activation of spent adsorbent (calcinations) The spent adsorbent is activated by calcinations before reuse. Dry crucible is weighted and adsorbent is placed over it before putting into the furnace. The furnace is set to the temperature of 400 °C for 4 hours for calcinations to take place.