

Decolorisation of crude palm oil by acid-activated spent bleaching earth

ABSTRACT

Regeneration of spent bleaching earth by acid activation and heat treatment has been investigated. Spent bleaching earth was activated by H₂SO₄ of various concentrations (16–40%) and heat treated at 120°C–350°C. The experimental results indicate that treatment of spent bleaching earth with 10% H₂SO₄ at 350°C produced a material which was most effective in removing coloured pigments from crude palm oil. Subsequent experiments were conducted using this particular acid-treated spent bleaching earth. Various parameters which affect the sorption process were studied. They include initial crude palm oil concentration, sorbent dosage and temperature. Applicability of both the Freundlich and Langmuir isotherms to the acid-treated spent bleaching earth/palm oil hexane miscella system indicates that both physisorption and chemisorption were involved in the sorption process. Measurements of various quality parameters of bleached and crude palm oils were carried out. They include Lovibond Colour index, carotene content, peroxide value, free fatty acid, fatty acid composition and iodine value. The results show that the bleached palm oil retained good oil quality after the decolorisation process using 10% acid-treated spent bleaching earth with a Lovibond Colour of 6.4.

Keyword: Acid activation; Crude palm oil; Decolorisation; Spent bleaching earth