

Abstract

Spent bleaching clay is a by-product in the bleaching of vegetable oils. It is dumped after use, an environmentally unfriendly option. This is because it cannot be re-used in the condition that it will be in. In this study the regeneration of spent bleaching clays was examined in model experiments to find better options to dumping and possibly cut refining costs by reusing it. The clay was first analysed quantitatively to determine if it was fit for the regeneration process. The quantitative procedures included de-oiling with solvent, determination of % organic and inorganic content by dry ashing and moisture content determination by drying to constant weight. Calcination subsequently followed by acid activation achieved regeneration of the spent clay. The amount of oil recovered from the spent clay was between 25-35%, while calcination and acid activation had relatively high yields ranging between 60-80%.

The properties of the regenerated clay among them particle size distribution, ion exchange capacity, bleaching power and adsorption isotherms were determined. The values obtained for the regenerated clay were significantly different to those obtained for virgin clay. Virgin clay is eight times more likely to remove colour than regenerated clay, both particle size distributions showed a normal distribution and virgin clay adsorbed more of all the pigments that both clays were exposed to. During the process significant results were obtained that helped in suggesting possible industrial applications of the regenerated product.