HUDA ALI MOHAMMED REDHA. REGENERATION OF USED BENTONITE AND WASTEWATER MATERIAL USING LASER TECHNIQUE. UNIVERSITY OF TECHNOLOGY. DEPARTMENT OF LASER AND OPTOELECTRONIC ENGINEERING. M.SC. Supervised: Asst. Prof. Dr. AYAD ZWAYEN MOHAMMED and Asst. prof. Dr. ADEL SHARIF HAMADI. 2017.

Abstract

The bentonite is an adsorbent material that is used frequently in industrial fields. bentonite was used with laser to treat wastewater, when laser is a new technique that has ability to remove the dye. using of laser as a source to refresh with high efficiency has the important in industrial field.

In this study laser diode with power 50 mw, He-Ne laser with power 10 mw and DPSSL with power 500 mw were used with the help of ultrasonic bath and H_2O_2 to promote the work of the laser. AFM and FTIR testing were made to bentonite to study the characteristics of it. Minitab program was used to facilitate calculations and choose the optimum parameters of experiments.

The optimum input conditions of experiments to remove the dye from wastewater were chosen. The best concentration of bentonite is 4 g/l, the best temperature of wastewater is 42 $^{\circ}$C, the best time of work is 27 min and the best concentration of H_2O_2 is 10%. It found from study that the increase of each parameters cause decrease in output concentration of wastewater. The accuracy of work was determined from Minitab program, it was 94.54%.

Keywords: bentonite, adsorption, wastewater, hydrogen peroxide, pigment, diode laser.