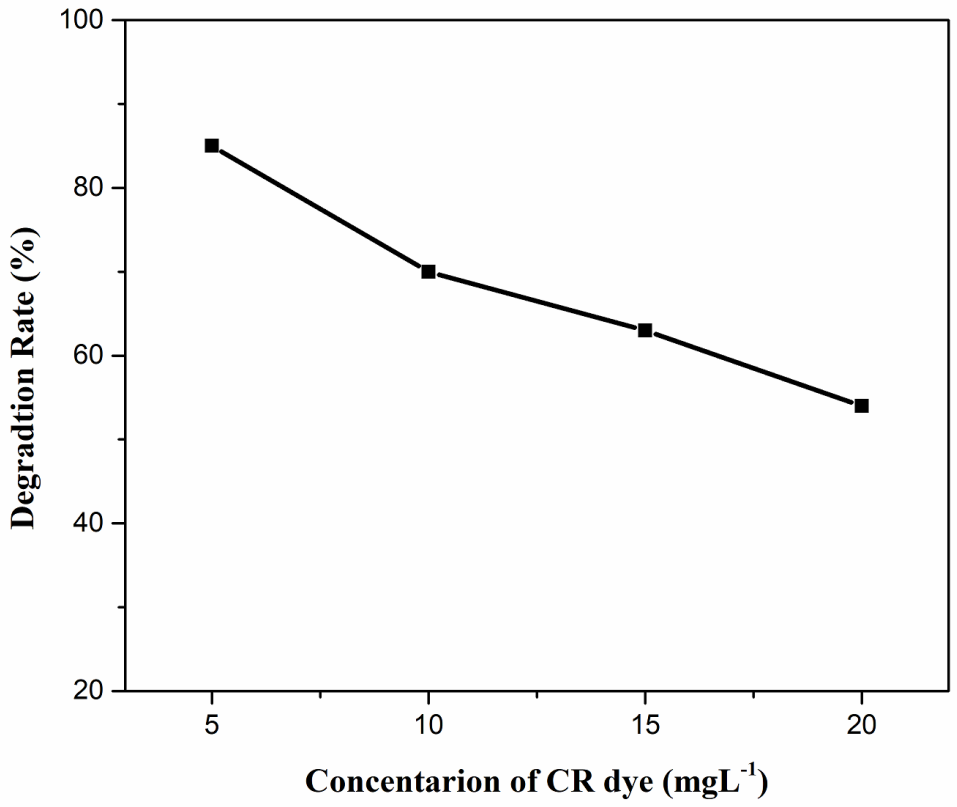
Initial Concentration of Congo red (CR) Dye

Aqueous solutions with different concentration of congo red dye were used to analyze the extent of degradation. 85 % removal rate was observed by using $5mgL^{-1}$. As the concentration of CR was increased, decreased degradation rate was obtained. Detoxification of pollutants depends on the production of a hole and OH radicals and its reaction with the organic pollutant. Possibility of reaction between radicals and dyestuff increases with the increase of initial concentration of CR. Therefore, the removal rate decreases with an increase in dye concentration. It was due to reduced production of radicals on the catalyst surface at high CR concentration. The higher degradation of pollutant takes place at the zone where high light intensity is irradiated. The other reason for the decreased degradation rate can be the absorption of visible light by dyestuff instead of the catalyst which decreases the efficiency of reaction as well as the formation of radicals.



Initial Concentration of Catalyst

Various amount of catalyst was used in aqueous solution CR 20mgL^{-1} for determining the effect of concentration of catalyst on degradation rate. Same reaction conditions were applied. Increased degradation was monitored by increasing the catalyst amount from 2.5 mg to 5 mg and then decreased by the increasing amount of catalyst from 7.5 to 10 mg. Best results were obtained by using 5 mg catalyst in an aqueous solution containing 20mgL^{-1} CR in 75 minutes. The reason behind this is the availability of more active sites with decreased penetration of light intensity. Some portion of the catalyst becomes unavailable and less degradation of dyes molecule occur.