Oil industries in Iraq consume large quantities of water and produce oil-contaminated water that may cause major pollution to the environment.

The aim of the present work is to enhance the efficiency of dispersed air flotation technique by using highly effective and cost-efficient coagulant to treat gas oil emulsion. The experimental work was carried out by using bubble flotation column of Perspex glass (5cm I.D, 120cm height). A liquid depth of 60cm. The perforated plate of the air distributor was (25 holes with 0.05 cm diameter). Also a high speed camera was used to measure the bubble rise velocity and bubble size.

Jar test experiments had showed that optimum dosage of (sawdust + bentonite at ratio 2:1) and alum concentration 30 mg/L at pH=4.

The present study is conducted to evaluate the effect of various parameters including bubble characteristics (bubble diameter and bubble rise velocity); pH (3, 4, 7 and 9); air flow rate (300, 500, 1000, and 1500 cm3/min); initial oil concentration (300, 500, 700 and 1000 ppm); concentration of SDS surfactants (25, 75 and 150 mg/L); and the effect of the addition coagulant (sawdust + bentonite at ratio 2:1) and alum.

The study had shown that the removal efficiency of COD, oil content and turbidity were related to the initial oil concentration; additive concentration of SDS and dose of coagulants. It was found that the flotation rate increases when using coagulants, the fastest removal rate was obtained at pH 4 and also the higher removal efficiency achieved was for flotation (87%), sawdust +bentonite (95.7%) and alum (97%).