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EFFECT OF CURRENT DENSITY AND OIL CONCENTRATION ON HYDRODYNAMIC ASPECTS IN ELECTROFLOTATION COLUMN DURING OIL/WATER EMULSION TREATMENT

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The objective of this work is to study the efficiency of electroflotation process by treatment of effluent from vegetable oil refining industry in the form of oil-water emulsion. We will interest to hydrodynamic aspects in electroflotation columns. We will study the effect of current density and oil concentration on bubbles diameter, bubbles rise velocity, Reynolds number and the effect of the latter on the efficiency of the oil recovery. To evaluate bubble's characteristics we used the method of video recording followed by an image processing, view of its simplicity this method is used widely. The different bubbles flow regimes were predicted by the calculation of Reynolds number. The efficiency of the process was estimated from turbidity.

Keywords: electroflotation, hydrodynamic, current density, emulsion, bubbles.

Introduction

An oily waste emulsion, in which oil is dispersed in the water phase, may contain any one of many types of oil with different concentrations. The treatment of oily waste water has done by many processes such as coagulation [1], flocculation [2], electrolysis [3], centrifugation [4], ultra-filtration [5] distillation [6] and electrocoagulation [7, 8] which make it possible to treat or disinfect waste waters in order to reduce their unwanted effects on the environment. In some of those processes such as: biological, petrochemical and chemical processes we used bubbles columns [9, 10]. Knowledge of bubbles properties like bubbles size distribution and gas holdup is necessary to modeling, design and scale-up of those columns [11]. Bubbles columns had many advantages they had a simple construction with no moving parts, also the costs of maintenance and operations are low and they had an excellent characteristic of heat and

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Received 17.01.2017