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The Influence of the Air Flow Injected on the Process of Flotation Using a Demulsifier Based on Castor Oil

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Abstract – Flotation is the most common technique used for the treatment of the produced water. The addition of demulsifier accelerate this process, it acts on the interactions of the system interfaces. Thus, this work is a study of the efficiency of flotation process using demulsifier based on castor oil. From the results a mathematical approach was reached, which relates the collisions between air bubbles and particles of emulsified oil. In conclusion, were observed that the efficiency of flotation was above 95% removal of oil.

During the oil production that operates systems with secondary recovery, it is common the co-production of the water used in the injection. This water, called produced water, usually contains a complex mixture of organic and inorganic compounds that can cause different effects on nature, therefore the water must be treated before disposal. The volume of produced water is associated with oil production and tends to grow with the life of the oilwell. The most common technique for treatment of this effluent is called flotation [1], which is a break of the emulsion oil/water, which to accelerate the separation phase adds demulsifier, since they act on the interactions interfaces of the system [2]. This behavior is a consequence of the demulsifier composition which is based on castor oil and has a carbon 12 hydroxyl at the lipophilic chain, which facilitates their performance in emulsions oil/water [3].

In this context, the objective of this work is to study the efficiency of the flotation process using demulsifier based on castor oil, which varies the gas flux injected, as Figure 01.

From the results a mathematical approach was reached, which relates the collisions between air bubbles and particles of emulsified oil, considering the system viscosity, the amount of bubbles injected and the air flux, which this term is about the kinetics of the process.

In conclusion, was observed that the efficiency of flotation was above 95% of oil removed as shown in Figure 02. The concentration of demulsifier used with greater separation efficiency of oil/water (O/W) was in the range 11 to 44ppm, which is a value well below of the Critical Micellar Concentration for demulsifier under study.

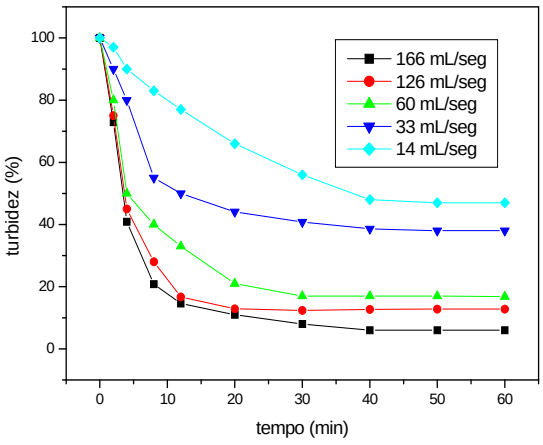

Figure 1: Percentage of Turbidity as a function of time for different gas flux injected.

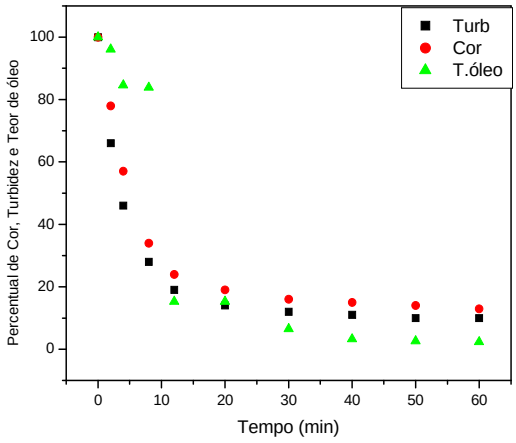

Figure 2: Variation of percentage of color, turbidity and oil content as a function of time for the flotation agent.

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