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Influence of the Flow Rate Ratio in a Jet Pump on the Size of Air Bubbles

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Abstract : In waste water treatment processes, aeration introduces air into a liquid. In these systems, air is introduced by different devices submerged in the waste water. Smaller bubbles result in more bubble surface area per unit of volume and higher oxygen transfer efficiency. Jet pumps are devices that use air bubbles and are widely used in waste water treatment processes. The principle of jet pumps is their ability to transfer energy of one fluid, called primary or motive, into a secondary fluid or gas. These pumps have no moving parts and are able to work in remote areas under extreme conditions. The objective of this work is to study experimentally the characteristics of the jet pump and the size of air bubbles in the laboratory water tank. The effect of flow rate ratio on pump performance is investigated in order to have a better understanding about pump behavior under various conditions, in order to determine the efficiency of receiving air bubbles different sizes. The experiments show that we should take care when increasing the flow rate ratio while seeking to decrease bubble size in the outlet flow. This study will help improve and extend the use of the jet pump in many practical applications.

Keywords : jet pump, air bubbles size, retention time, waste water
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