

Kinematika Partikel pada Proses Flotasi = Kinematic of Particles in Flotation Process

Kevin Irdyan Hardwin, author

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Abstrak

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Teknologi gelembung pada saat ini digunakan diberbagai industri dan berbagai aspek. Teknologi gelembung yang digunakan pada penelitian kali ini adalah proses flotation. Proses flotasi ini prinsipnya adalah pemisahan material dengan menggunakan gelembung. Pemisahan yang dilakukan adalah dengan memisahkan material berharga dan tidak berharga. Material berharga tersebut dapat dipisahkan dari material pengotor seperti tanah, pasir, dan debu karena adanya sifat material yaitu hydrophobic dan hydrophilic. Dalam penelitian kali ini, parameter proses flotasi yang diteliti adalah kinematika dari partikel yang berinteraksi dengan gelembung. Kinematika partikel ini dipelajari untuk mendapatkan hasil pengaruh geometri dan ukuran pada partikel di proses flotasi. Partikel yang digunakan adalah partikel berukuran 300, 212, 150 dan 106 mikron. Pengambilan data dilakukan dengan menggunakan High Speed Video Camera. Data hasil pengamatan ini didapatkan hasil partikel yang digunakan dominan berbentuk bladed – sub angular. Jarak Rc paling efektif didapatkan pada jarak $Rc = 0$ atau tepat ditengah gelembung dan jarak $Rc = 1/2 r$ gelembung serta probabilitas tumbukan dan pelekatan partikel berdasarkan Rc . Kecepatan terminal juga didapatkan tren $300 \text{ mikron} > 212 \text{ mikron} > 150 \text{ mikron} > 106 \text{ mikron}$. Terakhir adalah interaksi antara partikel dengan gelembung yang memiliki lima zona berdasarkan perpindahannya terhadap waktu. Hasil pengamatan dan analisis ini diharapkan dapat mendukung pengembangan proses flotasi kedepannya.

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ABSTRACT

Bubble technology is currently being used in various industries and various aspects. Bubble technology used in this research is the process of flotation. The flotation process is the principle of separation of materials by using a bubble. Separation is done by separating the valuable material and worthless. The valuable material can be separated from material impurities such as soil, sand, and dust because of the nature of the material that is hydrophobic and hydrophilic. In the present study, the flotation process parameters studied were the kinematics of particles that interact with the bubbles. Particle kinematics is studied to get the effect of the geometry and size of the particles in the flotation process. Particles diameter are 300, 212, 150 and 106 microns. Data collection was performed by using a High Speed Video Camera. Data from these observations showed that the particles are used predominantly shaped bladed - sub angular. Rc most effective distance obtained at the distance $Rc = 0$ or right in the middle of bubbles and distance $Rc = 1/2 r$ bubble as well as the probability of collision and adhesion of particles based Rc . Terminal velocity also found a trend of $300 \text{ microns} > 212 \text{ microns} > 150 \text{ microns} > 106 \text{ microns}$. The latter is the interaction between particles with the bubble which has five zones based on the displacement of the time. The observation and analysis is expected to support the future development of the flotation process., Bubble technology is currently being used in various industries and various aspects. Bubble technology used in this research is the process of flotation. The flotation process is the principle of separation of materials by using a bubble. Separation is done by

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