

Slurry rheology prediction based on hyperspectral characterization models for minerals quantification

Por: [Merril, J](#) (Merril, Javier)^[1]; [Voisin, L](#) (Voisin, Leandro)^[1,3]; [Montenegro, V](#) (Montenegro, Víctor)^[2]; [Ihle, CF](#) (Ihle, Christian F.)^[1,3]; [McFarlane, A](#) (McFarlane, Angus)^[4]

[Ver ResearcherID y ORCID](#)

MINERALS ENGINEERING

Volumen: 109

Páginas: 126-134

DOI: 10.1016/j.mineng.2017.03.009

Fecha de publicación: AUG 1 2017

[Ver impacto de la revista](#)

Resumen

The presence of clays in mineral processing offers a number of challenges that range from valuable species recovery to the transport of tailings. In particular, when the abundance of one or more clay types increases, the rheology may be significantly affected. In this paper, the feasibility of using hyperspectral characterization to estimate rheological properties of mineral suspensions was studied. Towards this purpose, a set of rheology measurements was made for slurries of different composition, combining up to three out of five minerals: three clay minerals (two bentonites from different sources and kaolin), quartz and white mica, which are the main gangue-minerals present in the Chilean copper mining industry. Using a Bingham Plastic flow model, a set of ternary plots for Bingham viscosity and yield stress was obtained. Results show counter-intuitive behavior for kaolin-white mica mixtures, showing a minimum for viscosity at a 2:3 ratio respectively. In addition, mechanisms for lowering the high viscosity reached by bentonite slurries were assessed. Modelling of the hyperspectral data produced high accuracy estimates of the mineral abundances, enabling an accurate determination of the respective samples position in the ternary mineralogy-rheology diagrams.

Palabras clave

Palabras clave de autor: [Rheology](#); [Suspension](#); [Spectroscopy](#); [Clay](#); [Mineral processing](#); [Geometallurgy](#)

KeyWords Plus: [CLAY-MINERALS](#); [BENTONITE SUSPENSIONS](#); [NORTHERN CHILE](#); [GOLD FLOTATION](#); [BEHAVIOR](#); [COPPER](#); [MINERALIZATION](#); [DISPERSIONS](#); [DISPOSAL](#); [WATER](#)

Información del autor

Dirección para petición de copias: Merrill, J (autor para petición de copias)

 Univ Chile, AMTC, Santiago 2007, Chile.

Direcciones:

- + [1] Univ Chile, AMTC, Santiago 2007, Chile
- + [2] CSIRO, Chile Int Ctr Excellence, Apoquindo 2827, 12 Floor, Santiago, Chile
- + [3] Univ Chile, Dept Min Engr, Santiago 2069, Chile
- + [4] CSIRO, Mineral Resources Australia, 26 Dick Perry Av, Kensington, NSW, Australia

Direcciones de correo electrónico: javier.merrill@csiro.au

Financiación

Entidad financiadora	Número de concesión
National Commission for Science and Technology (Conicyt) through Fondecyt Project	1160971
	1OCEII-9007

[Ver texto de financiación](#)

Editorial

PERGAMON-ELSEVIER SCIENCE LTD, THE BOULEVARD, LANGFORD LANE, KIDLINGTON, OXFORD OX5 1GB, ENGLAND

Categorías / Clasificación

Áreas de investigación: Engineering; Mineralogy; Mining & Mineral Processing

Categorías de Web of Science: Engineering, Chemical; Mineralogy; Mining & Mineral Processing

Información del documento

Tipo de documento: Article

Idioma: English

Número de acceso: **WOS:000402350100012**

ISSN: 0892-6875

Información de la revista

- Impact Factor: [Journal Citation Reports](#)

Otra información

Número IDS: EW2TY

Referencias citadas en la Colección principal de Web of Science: **43**

Veces citado en la Colección principal de Web of Science: **1**