

Technical Program

trend. Along with the change of frequency, permittivity real parts of the five sulfur-containing compounds basically have consistent variation tendencies. That is Diphenyl sulfoxide > Diphenyl sulfone > Diphenyl disulfide > Dibenzothiophene > Dodecyl, the size of the permittivity real parts decreases with the increase of the change frequency, which meets the change rule of dielectric. The dynamic response of Aromatic sulfur-containing compounds is stronger than Aliphatic model compounds.

Mechanism of Roasting Additives and Active Role of Vanadium Extraction from Stone Coal: Yi-min Zhang¹; Shen-xu Bao¹; Xiao-bo Zhu¹; ¹University of Technology

Conventional NaCl roasting-water leaching technique is not suitable for high calcium mica-type stone coal. Different sodium salts and potassium salts were selected as roasting additives for vanadium extraction from stone coal combining with NaCl and the results show that K₂SO₄ is the optimal one. When K₂SO₄ is solely used as additive, most calcium easily reacts with SiO₂ and vanadium to form water-insoluble calcium vanadates, which leads to low water leaching of vanadium. As K₂SO₄ is added, the K₂SO₄ is decomposed into K₂O and SO₂ during roasting. On the one hand, the K₂O can accelerate the decomposition of vanadium-bearing mica-type minerals and enhance the liberation of vanadium by forming potassium-soda feldspar. On the other hand, the released SO₂ will react with active calcium to form anhydrite, which suppresses the formation of calcium vanadates. The XEDS results also demonstrate that there are no calcium vanadates in roasting products when NaCl and 8% K₂SO₄ are added. Thermodynamic calculations indicate that calcium vanadates inevitably form during roasting of high calcium stone coal with NaCl. However, the anhydrite is produced more than anorthite and potassium-soda feldspar. In case K₂SO₄ is added, the released SO₂ will preferentially react with calcium and this is beneficial to the formation of potassium-soda feldspar and the liberation of vanadium. This study provides relatively appropriate roasting additives for vanadium extraction from the refractory stone coal.

Concentration of a Brazilian Refractory Bauxite by Direct Flotation: Felipe André Barbosa¹; Mauricio Bergerman¹; Daniela Horta¹; ¹Alfenas Federal University

Bauxite is an ore that consists of aluminum hydroxide minerals and impurities which are mainly composed by silicates, iron oxides (goethite and hematite), titanium oxides, aluminosilicates, among others. The studied bauxite ore is intended to the refractory industry, whose market specifications request for iron content lesser than 2.5%. The objective of this study was to investigate the applicability of direct flotation route so as to concentrate bauxite ore from Barro Alto-GO. The sample was initially comminuted and characterized. After that, it were accomplished flotation experiments in order to investigate the influence of collector (Hidroxamate-Cytec) dosage, flotation pH (8.5, 9.5, 10.5) and milling time (6, 8 e 10 min) on the reduction of the iron content. It was observed that the increase of collector dosage conducted to the increase in metallurgic recovery of alumina (Al₂O₃), and consequent decrease in its grade besides a rise in the Fe₂O₃ content. With the same collector dosage (395 g/t), it was found that the pH which yielded the greater performance of concentration by flotation was 9.5. The study of the influence of milling time revealed that the major milling time (10 min) produced more efficient results of Al₂O₃ recovery, and content of both alumina and contaminants. The experiment which conducted to more appropriated results was those carried out with 395 g/t of collector, pH 9.5 and 10 min of milling. The result was a concentrated with 3.74% of Fe₂O₃, 60.00% of Al₂O₃, and metallurgic recovery of 40.87%.

Tensile Behavior of an Eutectic Pb-Sn Alloy Processed by ECAP and Rolling: Livia Lugon¹; Roberto Figueiredo¹; Paulo Cetlin¹; ¹Universidade Federal de Minas Gerais

An eutectic lead-tin alloy was prepared by melting the commercially pure metals and cast in cylindrical molds with 10 mm diameter. The billets were processed by 4 passes of ECAP using a die with 90° between channels through route A and rolled to a final thickness of ~1 mm. The microstructure was determined by optical microscopy. Tensile tests were carried out at room temperature in the strain rate range between 10⁻⁴ – 10⁻² s⁻¹. The results show the elongation to failure increases at low strain-rates. The strain-rate sensitivity parameter was determined and a maximum value of ~0.4 is observed at the lowest strain-rate.

POSTERS



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Welcome to the ABM-TMS Second Pan American Materials Conference - 2014



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The Pan American Materials Conference hopes to achieve, for the first time, an integration of the leading materials societies on our two continents. There are a number of national societies in the Americas dedicated to metallurgical and materials engineering as well as mining and minerals technology in distinct countries. These societies pursue parallel efforts, address industrial needs, and promote training, technical education and a forum for the presentation of scientific research. The structure of this conference is based on eleven symposia that will permit interactions of prominent researchers in the most relevant themes and allow collaboration in R&D projects of common interest. The enthusiastic support of this concept by the two organizing societies, TMS (The Minerals, Metals & Materials Society) and ABM (Brazilian Metallurgical, Materials and Mining Association), the talent and time donated by the organizers of all symposia ensured the success of our ambitious event and the amazing response by the community.

As the leading materials and minerals society in Brazil, ABM is welcoming the sister societies and acknowledges the presence of their representatives and all authors who are contributing to the success of the Pan American Materials Conference. We hope that all participants will derive the full benefit of this meeting and welcome comments that will make future meetings even more productive. We encourage the authors of contributions to submit their manuscripts to the Journal of Materials Research and Technology, a young joint Elsevier-ABM venue with high standards and a bright future.

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