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Serbian Foundrymen's Society
Metallurgical Academic Network of SEE Countries
Institute for Technology of Nuclear and Other Mineral Raw Materials
Institute of Chemistry, Technology and Metallurgy
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MME SEE

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PREFACE

The Third Metallurgical & Materials Engineering Congress of South-East Europe (MME SEE 2017), organized by Association of Metallurgical Engineers of Serbia and Faculty of Technology and Metallurgy University of Belgrade, takes place in Belgrade, Serbia, 01-03 June 2017. This is a biannual meeting of specialists, scientists and professionals working in the field of metallurgical and materials engineering. The aim of the congress is to present current research results related to processing/structure/property relationships, advances in processing, characterization and applications of modern materials.

The Congress is aided by the Metallurgical Academic Network of SEE Countries, SEE Associations of Metallurgical Engineers and Chambers of Commerce of SEE Countries, Serbian Foundrymen's Society, Institute for Technology of Nuclear and Other Mineral Raw Materials, Institute of Chemistry, Technology and Metallurgy and Vinca Institute of Nuclear Sciences.

The Congress involves together a wide range of related topics and presents the views from both academia and industry. Future of metals/materials industry in South-East European countries; Raw materials; New industrial achievements, developments and trends in metals/materials; Ferrous and nonferrous metals production; Metal forming, casting, refractories and powder metallurgy; New and advanced ceramics, polymers and composites; Characterization and structure of materials; Recycling and waste minimization; Corrosion, coating, and protection of materials; Process control and modelling; Nanotechnology; Sustainable development; Welding; Environmental protection are all covered in the Book of abstracts.

The Editors hope that the Congress will stimulate new ideas and improve the knowledge in the field of metallurgical and materials engineering.

The Editors would like to thank the Scientific and the Organizing Committee, the Congress Secretariat - CONGREXPO d.o.o. and all those who helped in making the Congress a success.

Exceptionally grateful to the sponsors without whom our Congress would not be possible:

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We would like to express sincere appreciation to the Ministry of Education, Science, and Technological Development of the Republic of Serbia for their endeavor to make this Congress successful.

Editors

SPHALERITE PASSIVATION DURING THE LEACHING IN SODIUM NITRATE AND SULPHURIC ACID SOLUTION

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Zinc is extracted from sphalerite and complex concentrates by pyrometallurgical or hydrometallurgical processes, whereby the hydrometallurgical processes have received considerable attention in recent years. Their application provide better metal recoveries and reduced emission of gaseous and toxic agenses in the environment. This paper studies the leaching process of the sphalerite with sodium nitrate in sulphuric acid solution. Chemical reactions of leaching and their thermodynamic probabilities are predicted based on the calculated Gibbs energies and analysis of E-pH diagrams. Thermodynamic analysis, experimental data, chemical, XRD, TG/DTA, and SEM/EDX analyses for the phases present in both the complex concentrate and leach residue were performed to determine the leaching process. Elemental sulphur is the main solid product of reaction, and a minor amount of sulphide sulphur is oxidized to sulphate during the leaching. It also indicates that the sulphur precipitated at the particle surfaces, and slowed down the rate of the leaching process.

Keywords: leaching; sphalerite passivation; elemental sulphur; sulphuric acid; sodium nitrate

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