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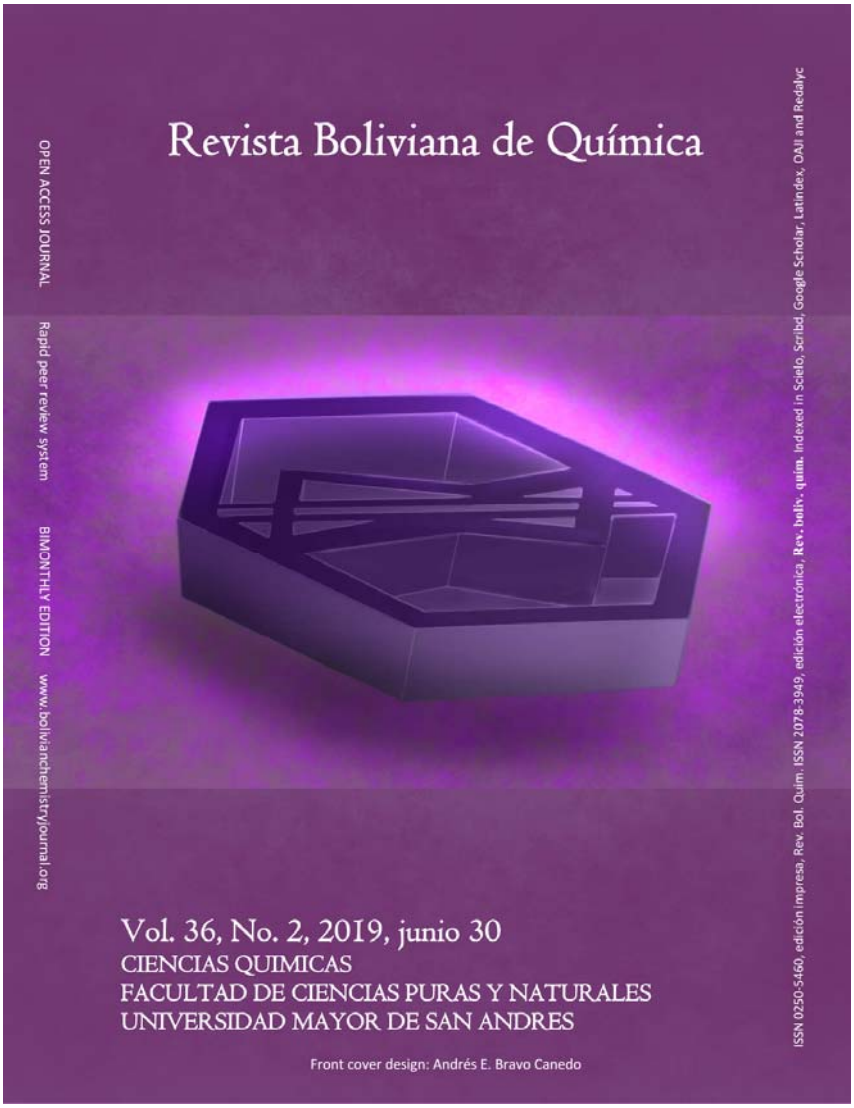
Abstracts



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ANALYSIS OF HARDNESS AND RESISTANCE TO THE TRACTION OF AN Al-SiO_2 METAL MATRIX COMPOSITE, USING ALUMINUM CANS AND RICE HULLS AS RAW MATERIAL

ANÁLISIS DE DUREZA Y RESISTENCIA A LA TRACCIÓN DE UN COMPUESTO DE MATRIZ METÁLICA Al-SiO_2, UTILIZANDO LATAS DE ALUMINIO Y CÁSCARA DE ARROZ COMO MATERIA PRIMA

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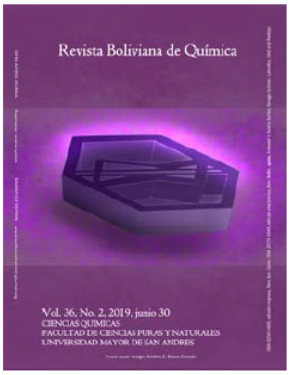

Full original article *Peer-reviewed*

Cesar A. Andrade-Tacca[1,*], Nemesio Edgar Veliz Llayqui[2], Carlos F. Medina-Caceres[1,2]

[1]Escuela Profesional de Ingenieria Ambiental, Facultad de Ingenieria de Procesos FIP, Universidad Nacional de San Agustín de Arequipa UNSA, Av. Independencia s/n-Pab. Antonio Raimondi-4to piso, Area de Ingenierias, Tel. +5154201723, Arequipa, Perú, ambiental@unsa.edu.pe, http://fip.unsa.edu.pe/ingambiental/

[2]Escuela Profesional de Ingeniería Metalúrgica, Facultad de Ingeniería de Procesos FIP, Universidad Nacional de San Agustín de Arequipa UNSA, Av. Independencia s/n-Pab. Ing. Metalúrgica, Tel. +5154282813, Arequipa, Perú, metalurgia@unsa.edu.pe, http://fip.unsa.edu.pe/ingmetalurgica/

Keywords: *Composite material, Aluminum, Rice hulls, Mechanical properties, Direct mixture.*

Palabras clave: *Material compuesto, Aluminio, Cascarilla de arroz, Propiedades mecánicas, Mezcla directa.*

ABSTRACT

In the present investigation we have developed a metal matrix composite material (MCMM) of aluminum reinforced with rice husk ash particles (RHA).. The MCMM, with 2.5% amorphous silica, 5% in weight (volume), were manufactured from aluminum waste, specifically cans, and amorphous silica particles (less than 1mm) obtained from burning rice husk (RH). The manufacturing process was based on fusion metallurgy, a direct mixing process for composite materials (CM). In this regard, the mechanical properties of the matrix made from the can were determined, comparing them with the results of the mechanical tests of hardness and tensile strength obtained from the new MCMM.. In addition, it was determined that higher concentrations of amorphous silica in the matrix increased the hardness of the alloys, while a higher level of amorphous silica decreased elongation.

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2

EFFECT OF THE VARIATION OF THE Z6, 404 AND 1208 COLLECTORS IN THE BULK FLOTATION OF PYRITE AND AURIFEROUS ARSENOPYRITE

EFECTO DE LA VARIACIÓN DE LOS COLECTORES Z6, 404 Y 1208 EN LA FLOTACIÓN A GRANEL DE PIRITA Y ARSENOPIRITA AURÍFERA

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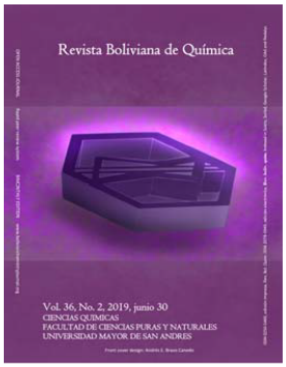

Full original article *Peer-reviewed*

Hugo I. Romero Bonilla[1,*], Diego A. Romero Sagbay[2], Felipe F. Redrovan Pesantez[3]

[1]Grupo de Investigación Aplicaciones Electro-analíticas, Laboratorio de Electro-analítica y Bioenergía, Carrera de Ingeniería Química, Universidad Técnica de Machala, Machala, El Oro, Ecuador. ORCID: 0000-0002-7846-0512

[2]Carrera de Ingeniería Química, Universidad Técnica de Machala, Km 5.5 Vía Pasaje, Machala, Ecuador

[3]Carrera de Ingeniería en Alimentos, Universidad Técnica de Machala, Km 5.5 Vía Pasaje, Machala, Ecuador. ORCID: 0000-0001-9157-4760

Keywords: *Collector, Gold recovery, Percentage of pulp solids.*

Palabras clave: *Colector, Recuperación de oro, Porcentaje de sólidos, Pulpa.*

ABSTRACT

The objective of the present investigation was to determine the influence that the types of manifold mix had: (potassium ammonium xanthate Z6 primary collector + dithiophosphate 404 secondary collector) and (Z6 + dithiophosphate 1208 secondary collector) at different dosages in the flotation cell : 100% (normally used in the process); 50% and 150% in relation to the activator CuSO4.5H2O and the sparkling 350, in the percentage of gold recovery. Secondary collector concentrations of 10% and 100% purity were used. The percentage of the solid pulp of the mineral was also evaluated (27%, 30%, 33%, and 37%). Gold recovery was determined by measuring its concentration by atomic absorption spectrophotometry. It was determined that with 33% solids in the pulp, there is the highest percentage of gold recovery. Likewise, the replacement of the secondary dithiophosphate 404 collector with the dithiophosphate 1208 provided better recovery results when they were added at 10% and 100% purity concentrations. Additionally, it was possible to demonstrate that with the reduction of the amount of the Z6 collector and the activator, greater recovery was achieved with 100% dosage, which is what is normally used in the beneficiary plant where the experimentation was performed. Finally, it was statistically determined that the type of secondary collector does not influence the recovery percentage (p-value> 0.05). Whereas, there is an influence (p-value <0.05) of the percentage of solids in the pulp in the recovery percentage of this metal.

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3

CONCENTRATION OF HEAVY METALS: CHROME, CADMIUM AND LEAD IN SURFACE SEDIMENTS IN THE RIVER COATA, PERU

CONCENTRACIÓN DE METALES PESADOS: CROMO, CADMIO Y PLOMO EN LOS SEDIMENTOS SUPERFICIALES EN EL RÍO COATA, PERÚ

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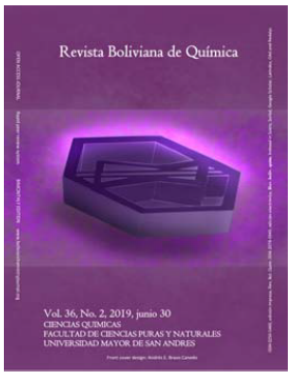

Full original article *Peer-reviewed*

Raúl F. Quispe Yana[1], Germán Belizario Quispe[1], Heber N. Chui Betancur[2,*], Samuel Huaquisto Cáceres[1], Alfredo P. Calatayud Mendoza[3], Percy S. Yábar Miranda[2]

[1]Escuela Profesional de Ingeniería Agrícola, Universidad Nacional del Altiplano de Puno, Av. Floral Nº 1153, Puno, Perú. belge29@hotmail.com

[2]Instituto de Investigación de Ciencias Naturales y Tecnología de la Facultad de Ciencias de la de la Educación, Universidad Nacional del Altiplano de Puno, Av. Floral Nº 1153, Puno, Perú

[3]Escuela Profesional de Ingeniería Económica, Universidad Nacional del Altiplano de Puno, Av. Floral Nº 1153, Puno, Perú

Keywords: *Pollution, Heavy metals, Surface sediments, Coata River, Titicaca, Perú.*

Palabras clave: *Contaminación, Metales pesados, Sedimentos superficiales, Río Coata, Titicaca, Perú.*

ABSTRACT

This article describes the determination of heavy metals, namely: chromium (Cr), cadmium (Cd) and lead (Pb), in surface sediments of the lower Coata river basin, considered as the most important fluvial artery tributary of the Titicaca lake in Peru. The contamination of water bodies, sediments and other components of ecological diversity was evaluated. The determination was made twice during 2017, at high and low runoff periods of the year, in five strategic points. The minimum and maximum concentration range found was 4.10 mg / kg Cr, 0.10 mg / kg Cd, and 3.75 mg / kg Pb, and, 28.42 mg / kg Cr, 0.70 mg / kg Cd, and 16.50 mg / kg Pb, respectively. Some minimum values found, exceed the acceptable minimums established in the Environmental Quality Standards for Soil of the Ministry of Environment of Peru. The possible causes of the pollution detected are the anthropic action with an impact on the wastewater of the city of Juliaca, Peru. The quantification of these elements was performed by atomic absorption spectroscopy EPA method.

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4

DIRECT SYNTHESIS OF DIMETHYL ETHER FROM SYNGAS. PART I: PREPARATION OF BIFUNCTIONAL CuO-ZnO/HZSM-5 CATALYSTS BY SUCCESSIVE SINTHESIS AND PHYSICAL MIXTURE

SÍNTESIS DIRECTA DE ETER DIMETÍLICO DE SYNGAS. PARTE I: PREPARACIÓN DE LOS CATALIZADORES BIFUNCIONALES DE CuO-ZnO / HZSM-5 POR SÍNTESIS SUCESIVA Y MEZCLA FÍSICA

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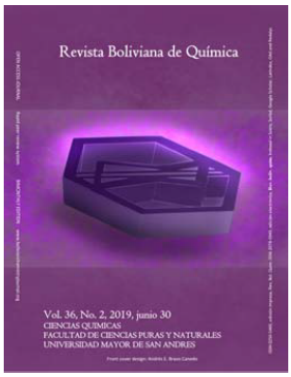

Full original article *Peer-reviewed*

Dayana M. Capcha Vargas[1,*], Ronald M. Lara Prado[1], Yamil Acho Sarzuri[2], Saul Cabrera[1,2], Luis Lopez[1,2].

[1]Department of Chemical Sciences, Instituto de Investigaciones Químicas IIQ, Laboratorio de Ciencia de Materiales, School of Pure and Natural Sciences FCPN, Universidad Mayor de San Andrés UMSA, P.O. Box 303, Calle Andrés Bello s/n-Edificio IIQ, Ciudad Universitaria Cota Cota, Phone +59122795878, La Paz, Bolivia, http://cienciasquimicas.umsa.bo/

[2]Department of Chemical Sciences, Instituto del Gas Natural IGN, School of Pure and Natural Sciences FCPN, Universidad Mayor de San Andrés UMSA, P.O. Box 303, Calle Andrés Bello s/n-Edificio IIQ, Ciudad Universitaria Cota Cota, Phone +59122795878, La Paz, Bolivia, http://cienciasquimicas.umsa.bo/

Keywords: *Bifunctional catalyst, CuO-ZnO, HZSM-5, successive synthesis, physical mixture.*

Palabras clave: *Catalizador bifuncional, CuO-ZnO, HZSM-5, síntesis sucesiva, mezcla física.*

ABSTRACT

The direct synthesis of dimethylether (DME) from synthesis gas ($CO + H_2$) requires bifunctional catalysts type CuO-ZnO/HZSM-5, where the CuO-ZnO performs the synthesis of methanol by its hydrogenation activity and the HZSM-5 zeolite performs the dehydration of methanol by its acid activity. In this work, two methods of preparation of the bifunctional catalyst are compared: by successive synthesis (catalyst name CuO-ZnO/S-HZSM-5) and by physical mixture (catalyst name CuO-ZnO/HZSM-5). For this purpose, CuO-ZnO, HZSM-5 and silicalite were first prepared and characterized. In the preparation of the bifunctional catalyst CuO-ZnO/S-HZSM-5, silicalite (S) was incorporated to favor the growth of crystals with MFI-like structure (Zeolite Socony Mobil - FIVE).. All catalysts were characterized by the technique of X-ray diffraction, reduction at programmed temperature and desorption of NH_3 at programmed temperature. The crystallinity of CuO in the CuO-ZnO, CuO-ZnO / S-HZSM-5 and CuO-ZnO-HZSM-5 catalysts was 67%, 49% and 64%, respectively. The maximum reduction temperature found for the CuO-ZnO / S-HZSM-5 was 306 °C, which differs from the bifunctional catalyst by physical mixing CuO-ZnO-HZSM-5 which was 282 °C, this change is related to the crystallinity of CuO, at a lower crystallinity of CuO; higher its reduction temperature. The CuO-ZnO / S-HZSM-5 catalyst has a Brönsted acidity equal to 0.37mol NH_3/kg comparable to the acidity of pure zeolite HZSM-5 (0.41mol NH_3/kg), while the CuO-ZnO- catalyst HZSM-5 has a lower Brönsted acidity, equal to 0.25mol NH_3/kg.