

# Journal Comment

## Copper Cobalt Africa 6–8 July 2015

The African Copper Belt has experienced a huge resurgence of activity in the past decade following many years of political and economic instability. Today, an impressive proportion of capital spending, project development, operational expansions, and metal value production in the Southern African mining industry are occurring in this region. The geology and mineralogy of the ores differ significantly from those in other major copper-producing regions of the world, often having very high grades as well as the presence of cobalt. Both mining and metallurgy present some unique difficulties, not only in the technical arena, but also with respect to logistics and supply chain, human capital, community engagement, and legislative issues. With an increasingly mature industry developing in this region, the Metallurgy Technical Programme Committee took the decision to host the inaugural *Copper Cobalt Africa* conference, which also incorporated the *Eighth SAIMM Base Metals Conference*.

The conference was held in Livingstone, Zambia, a spectacular venue on the banks of the mighty Zambezi River and within walking distance of the world-famous Mosi-oa-Tunya (the *Smoke that Thunders* – better known as Victoria Falls). Despite an extremely difficult environment in the mining industry, interest in the conference was strong, consolidating the perception that this region is poised to become the leading global primary copper and cobalt producer in future years. The 54 papers presented represented authors from six continents and fifteen countries. The best of these are published for wider dissemination in this issue of the Journal.

The tone of the conference was set by the excellent keynote address of Jackson Sikamo, President of the Zambian Chamber of Mines, who provided an overview of the history of the Zambian mining industry (from private ownership, through nationalisation, and subsequent reprivatisation), and included views on challenges currently faced and suggestions as to how the industry can be nurtured to continue being a major driver for the Zambian economy and major player in the international copper mining business. Commissioning and ramp-up of the African Copper Belt's flagship operation, Tenke Fungurume Mining Company, was discussed by Scot Sandoval (Freeport McMoRan, USA), focussing

particularly on electrowinning improvements that enabled current efficiency of 92% to be achieved at a current density of 400 A/m<sup>2</sup>, which is amongst one of the highest current densities employed for copper electrowinning worldwide. Other keynote presentations included contributions on recent developments at Glencore's Mopani operation by CEO Johan Jansen (Zambia), the successful commissioning and ramp-up of Tiger Resources' Kipoi heap leaching operation by Brendan Moseley (Democratic Republic of Congo), an overview of international best practice in Operations & Maintenance by Rebecca Siwale of FLSmidth (USA), and an engineering vendor's insights into project development on the Copper Belt over the last fifteen years by John Parker of Process Ideas (South Africa).

The papers presented in this issue reflect the quality and diversity of the conference proceedings, ranging from fundamental research studies, through modelling and flowsheet and project development, to plant and process optimisation. Courtney Young and Jesse Bowden of Montana Tech (USA) used electrochemical methods to further understanding of the mechanism of xanthate adsorption on chalcopyrite surfaces; Thandazile Moyo and Jochen Petersen of the University of Cape Town (South Africa) also used electroanalytical techniques to examine the leaching of chalcopyrite in ammonium solutions. Fadeela Saljee and Frank Crundwell (CM Solutions, South Africa)



Rodney Jones (President-Elect of SAIMM), Kathy Sole (Conference Chair) and Jackson Sikamo (President of the Zambian Chamber of Mines) at the opening of the conference. (Photograph courtesy of Barry Wills.)

## Journal Comment *(continued)*

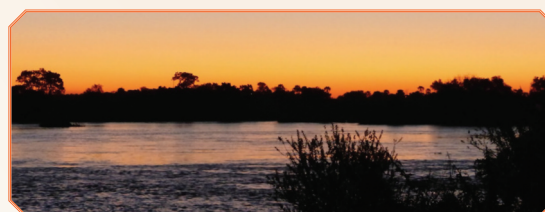
have derived an autoclave model combining mass, energy, and population balances for optimising the design of pressure leaching circuits for treating sulphide ores and concentrates. Peter Cole and colleagues (Cytec Industries) discussed the causes and mitigation of aqueous-in-organic entrainment in solvent extraction, a phenomenon that contributes to deteriorating electrolyte quality. A useful overview of the performance and behaviour of lead anodes for base-metals electrowinning, including practical information that is seldom reported, was given by Abbas Mirza and colleagues of RSR Technologies (USA).

New projects and flowsheet developments were also highlighted. Michael Valenta and Barbara Mulcahy (Metallicon Process Consulting, South Africa) described the development of a geometallurgical model for a copper concentrator in the Kalahari Copper Belt of Botswana, highlighting the synergies to project advancement when geology, mining, and metallurgy disciplines are all involved at early stages of the project. Vongani Nkuna and colleagues from Ivanhoe Mining Company discussed aspects of the metallurgical flowsheet proposed for the Giant Kamao project in the Democratic Republic of Congo, which is ranked as the world's largest undeveloped high-grade copper deposit.

With respect to current operations, Kathy Sole (independent consultant, South Africa) and Owen Tinkler (Cytec Solvay, USA) reviewed the status of copper solvent extraction on the Copper Belt and its unique challenges compared with other global operations. Optimisation of plant operations was



Delegates from the USA, Zambia, and DRC at the Welcome Event on the banks of the Zambezi River, including keynote speakers Rebecca Siwale (second from right) and Jackson Sikamo (right). (Photograph courtesy of Barry Wills.)



The sun sets in Africa over the Zambezi River. (Photograph courtesy of Barry Wills.)

covered in a paper by Chanda Ngulube and colleagues from Kansanshi Mine (Zambia), which describes modelling and medication of the concentrator circuit to adapt to effectively treating increasingly complex mixed oxide-sulphide transitional ores. Justin Hagemann and Max Pelser provided a fascinating overview of Rustenburg Base Metal Refiners' response to debottlenecking with minimal capital expenditure while expanding production from 21 kt/a to 33 kt/a nickel, based on a fundamental and theoretical approach to the problem and that ultimately culminated in a successful commercially implemented solution.

The conference was attended by some 180 delegates from nineteen countries, comprising researchers and academics, mining services professionals, vendors and technology suppliers, operations personnel, and consultants. Tremendous support was also received from sponsors, with demand for sponsorship and exhibition opportunities outstripping availability. Following the success of this inaugural event, SAIMM has great pleasure in announcing that the *Second Copper Cobalt Africa Conference* will take place in July 2018.

K.C. Sole  
Chair of the Organising Committee