

# International Future Mining Conference 2019

19–20 November 2019  
Sydney Australia

Text ● Jeon Sanghee (Hokkaido University)

一般財団法人日本鉱業振興会による「少壮研究者による海外科学技術研究調査助成」を受け実施された、海外渡航についての報告を紹介します。  
(資源・素材学会事務局)

## Short information about Future Mining Conference 2019

International Future Mining Conference was returned to Sydney on 19<sup>th</sup>-20<sup>th</sup> November 2019, headlined by the theme of 'Get Future Ready'. This eminent conference in mining field was mainly organized by The University of New South Wales, Australia (UNSW), University of Technology Sydney, Australia (UTS), University of Queensland, Australia (UQ), University of the Witwatersrand, South Africa (WITS), University of Leoben, Austria, Virginia Polytechnic Institute and State University, USA (Virgin Tech), BHP, and RWTH Aachen University, Germany, and also sponsored by various huge mining companies including BHP, Cognizant, Maptek, Rio Tinto, SKLRCRM, Clarity Advanced control, ispace, SeePilot, SensaWeb, Zededef, Australian Mining, and National Resources Review. About 250 participants from 16 countries including Australia, the USA, China, and Japan have participated, and the conference was held at International Convention Center Sydney.

## Purposes and main topics about Future Mining Conference 2019

Top researchers and industry leaders in the mining field was able to present ideas on the future mining industry needs in the digital age, transforming mining systems through integration of advanced technologies, and how to



Fig. 1 Photo of myself with conference banners

best achieve operational excellence with cost-competitive, safe and environmentally responsible operations. The main topics in the Future Mining Conference 2019 were as follow:

- (1) Artificial Intelligence, (2) Automation and Robotics, (3) Big Data, (4) Green Mining, (5) Mine Internet of things, (6) Mineral Processing Frontiers, (7) Technology Integration and Management, and (8) Space Mining.

## Program and contribution to the conference

The program of the present conference in detail is as follows:

- ◆ 18<sup>th</sup> Nov.: Future Mining Industry Workshop
- ◆ 19<sup>th</sup> Nov.: Sessions for Technology Integration & Management, FM/Green Mining Stream (Sustainable Mining Practices), Automation & Robotics, Mine Internet of Things
- ◆ 20<sup>th</sup> Nov.: Sessions for Big Data, Mine IoT & Technology Integration, Artificial Intelligence (AI), Mineral Processing Frontiers, Space Mining

In the Future Mining Conference, the participant gave a presentation entitled “*Recovery of gold from ammonium thiosulfate using synergistic effects of zero-valent aluminum and activated carbon*”. The content is able to be explained as follows: In gold hydrometallurgy, ammonium thiosulfate could be an alternative to toxic solvent (*i.e.*, cyanide) because of its non-toxic, and low-corrosiveness as

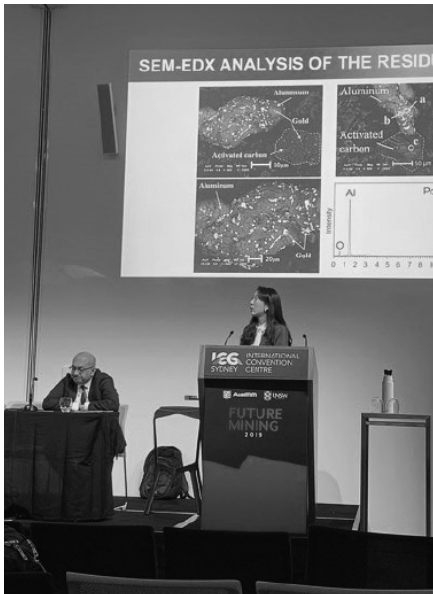


Fig. 2 During presentation



Fig. 3 Q & A panel discussion



Fig. 4 Future workforce for the mining industry



Fig. 5 Space mining session

well as high-selectivity for gold. Despite those advantages, the industrial application of the ammonium thiosulfate is limited so far because of its one big drawback, which is the recovery of dissolved gold ions from pregnant solution remains difficult. To recover gold ions from cyanide, conventionally adsorption by activated carbon or cementation by base metals (*e.g.*, copper, zinc, iron or aluminum) has been employed. When the aforementioned materials are applied in ammonium thiosulfate, however, the recovery efficiencies are negligible. The present study discussed a development of a novel recovery technique for gold from ammonium thiosulfate medium – recovery of gold from ammonium thiosulfate using zero-valent aluminum (ZVAI) and activated carbon. The gold recovery in a single system (*i.e.*, sole ZVAI or activated carbon) was negligible (recovery efficiency: 0) while over 99% of gold recovery could be obtained when both ZVAI and activated carbon present in ammonium thiosulfate solution. During the Q&A panel discussion, a deeper discussion was possible and also collaboration studies from China and Australia were proposed. Hopefully, an in-depth study is carried out, applied to commercial mining plant, and change the paradigm of the current gold-hydrometallurgy.

### Impressive session in Future Mining 2019

Recently interest in off-Earth mining (*i.e.*, space mining), which is the exploitation of materials from asteroids or other minor planets, is growing. In the 2019 Future

Mining conference, many studies about off-Earth mining were presented and it could be seen that NASA, CSIRO, and UNSW are mainly leading space mining. The primary resource of interest in space mining is focused on ice, since ice can be used to provide propellant and oxidizer for spacecraft, avoiding the cost of transporting these from Earth; the researchers reported that off-Earth ice mining can have an important bootstrapping function for space exploration and utilization, beginning with ice from the near-Earth asteroids and the moon.

Through the conference, the participant was able to attend the presentation by leading industry figures with opportunities to interact, have chances to engage with industry peers and international companies, and attend world-class technical discussions. Moreover, a truly global gathering of resources industry professionals also could be done. Based on the discussion of the notable findings from researchers all over the world, it was a great help to develop our research.

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