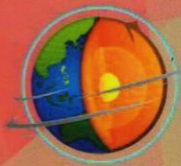


# 5TH ASIA AFRICA MINERAL RESOURCES CONFERENCE

25 - 29 July 2015 | Quezon City, Philippines



ASIA AFRICA MINERAL RESOURCES CONFERENCE

SYMPOSIUM PROGRAM

# 5<sup>th</sup> ASIA AFRICA Mineral Resources Conference

Time	Topic	Speaker	Institution
09:00 - 09:30	NOVOSIBIRSK		
09:30 - 10:00	Primary Processes of serpentinization in ore genesis		
10:00 - 10:30	Genesis of copper-gold deposits in the Mariana arc	Alfred Eigen, Brian L. J. Braaten, R. J. A. Chan	University of Oslo, Norway
10:30 - 11:00	Post-Conference Fieldwork		
11:00 - 11:30	Geology and mineral resources of the southern part of the island of Sumatra, Indonesia	Hans-Joachim Herrmann, Hans-Joachim Herrmann	Geological Institute of the University of Cologne, Germany
11:30 - 12:00	Preliminary study on the Hill Reef 1 and Hill Reef 2 areas of the Palawan Trough		

25-29 July 2015  
University of the Philippines,  
Diliman, Quezon City, Philippines

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# 5<sup>TH</sup> ASIA AFRICA MINERAL RESOURCES CONFERENCE

## SCIENTIFIC PROGRAM

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08:00 - 08:30	Registration	
08:30 - 08:45	Opening Remarks  <i>Prof. Koichiro Watanabe</i> <i>Kyushu University, Japan</i>	
	<i>Prof. Carla B. Dimalanta</i> <i>University of the Philippines, Philippines</i>	
08:45 - 09:00	- GROUP PHOTO SESSION -	
09:00 - 09:20	<b>Plenary Paper 1:</b> Potential role of serpentinization in ore genesis: An example from the Bou-Azzer ophiolite, Morocco <i>Shoji Arai</i> <i>Kanazawa University, Japan</i>	1
09:20 - 09:25	- Q&A -	
	<b>Session 1: Understanding the genesis of copper-gold deposits I</b> <i>Chairpersons: Dr. Kotaro Yonezu &amp; Dr. Betchaida D. Payot</i>	
09:25 - 09:40	The geology and mineralization of the Mankayan copper-gold deposits, Luzon, Philippines <i>R.J.R. Claveria</i> <i>Ateneo de Manila University, Philippines</i>	5
09:40 - 09:55	Epithermal mineralization at the Teine mine, southwestern Hokkaido, Japan <i>E.T. Yuningsih et al.</i> <i>Pajadjaran University, Indonesia</i>	9
09:55 - 10:10	Magmatic hydrothermal system at the southeastern Martabe high-sulfidation epithermal deposit, north Sumatra, Indonesia <i>S. Saing et al.</i> <i>Akita University, Indonesia</i>	15
10:10 - 10:25	Preliminary study on the Hill Reef 1 and Hill Reef 2 veins at the Poboya prospect based on textural characteristics <i>Syafrizal et al.</i> <i>Institute Technology Bandung, Indonesia</i>	21
10:25 - 10:35	- COFFEE BREAK -	

	<b>Session 2: Understanding the genesis of copper-gold deposits II</b> <i>Chairpersons: Dr. Rogel Santos &amp; Dr. Adi Maulana</i>	
10:35 - 10:50	Gold mineralization of the Olon Ovoot deposit in the Ulziit gold belt, southern Mongolia <i>S. Oyungerel et al.</i> <i>Kyushu University, Japan</i>	27
10:50 - 11:05	Mineralogy and geochemistry of the Ban Hoayxai Au-Ag gold deposit, Lao PDR <i>K.S. Ariffin et al.</i> <i>University Sains Malaysia, Malaysia</i>	33
11:05 - 11:20	Stream sediment geochemical study for gold target in the Salu Malua prospect, south Sulawesi, Indonesia <i>A. Maulana et al.</i> <i>Hasanuddin University, Indonesia</i>	38
11:20 - 11:35	Gold resources estimation by geostatistical model: A case study of gold mine in Thailand <i>S. Pumjan</i> <i>Chulalongkorn University, Thailand</i>	43
11:35 - 11:50	Characterization of the alteration mineralogy of the Masara gold district, Compostela Valley: Implications on its hydrothermal history <i>B.R.V. Villaplaza et al.</i> <i>University of the Philippines, Philippines</i>	48
11:50 - 13:00	- LUNCH BREAK -	
13:00 - 13:20	<b>Plenary Paper 2: Rare earth elements geochemistry of granitoids in Belitung Island, Indonesia</b> <i>Akira Imai</i> <i>Akita University, Japan</i>	51
13:20 - 13:25	- Q&A -	
	<b>Session 3: Probing for rare earth elements in various terranes</b> <i>Chairpersons: Prof. Mega Fatimah Rosana &amp; Dr. Thomas Tindell</i>	
13:25 - 13:40	Rare earth element (REE) metallogeny of Mongolia <i>S. Jargalan et al.</i> <i>Mongolian University of Science and Technology, Mongolia</i>	
13:40 - 13:55	Petrological, mineralogical and geochemical investigation on the rare earth elements (REE) enrichment in the granitoids in northern Palawan, Philippines <i>J.T. Padrones et al.</i> <i>Akita University, Japan</i>	55
13:55 - 14:10	Geology, mineralogy and geochemistry of granitoids associated with REE enrichment at Sibolga, north Sumatra, Indonesia <i>I. Setiawan et al.</i> <i>Akita University, Japan</i>	60

14:10 - 14:25	Controls on pegmatite hosted U-Th + REE mineralization at Hamisana shear zone area, South Eastern Desert, Egypt <i>W.S.A. Ibrahim et al.</i> <i>Nuclear Materials Authority, Egypt</i>	65
14:25 - 14:40	The limonite-saprolite interface as "bonanza horizon" for metals in nickeliferous laterite <i>R. Santos et al.</i> <i>MacroAsia Corporation, Philippines</i>	71
14:40 - 14:55	Initial geochemical research on scandium as by-product with MacroAsia's Infanta Ni laterite area, southern Palawan, Philippines <i>K. Yonezu et al.</i> <i>Kyushu University, Japan</i>	76
14:55 - 15:05	- COFFEE BREAK -	
	<i>Session 4: Examining the petrological and geochemical characteristics of mineralization-related host rocks</i> <i>Chairpersons: Dr. Decibel V. Faustino-Eslava &amp; Dr. Waleed Saad Ahmed Ibrahim</i>	
15:05 - 15:20	Geochemistry of magmatic rocks of northern Algeria, metallogenic implications <i>H. Benali</i> <i>University of Science and Technology-Houari Boumediene, Algeria</i>	81
15:20 - 15:35	Volcanic rocks of Sisophon area in northwestern Cambodia: Their tectonic setting and associated mineralization <i>P. Charusiri et al.</i> <i>Chulalongkorn University, Thailand</i>	82
15:35 - 15:50	Petrology of ophiolite complex of Ciletuh geopark, west Java, Indonesia: A preliminary study <i>M.F. Rosana et al.</i> <i>Pajadjaran University, Indonesia</i>	85
15:50 - 16:05	Geology of Algerian -Tunisian borders (eastern Saharan of Algeria): A review <i>L. Sami et al.</i> <i>University Mouloud Mammeri of Tizi Ouzou, Algeria</i>	89
16:05 - 16:20	Graphite-bearing rocks at Wadi El Gemal, South Eastern Desert, Egypt <i>M. Ahmed</i> <i>Nuclear Materials Authority, Egypt</i>	95
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	<b>Session 5: Defining mineralization conditions through isotopic and fluid inclusion studies</b> <i>Chairpersons: Prof. Charusiri Punya &amp; Dr. Noelynna T. Ramos</i>	
<b>09:05 - 09:20</b>	Mineral description and fluid inclusion study of gold bearing quartz veins in Hishikari mine, Kyushu, Japan-Implication to ore fluid characteristics and behaviors <i>R. Takahashi et al.</i> <i>Kyushu University, Japan</i>	103
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<b>09:50 - 10:00</b>	- COFFEE BREAK -	
	<b>Session 6: Exploring new techniques for mineral prospecting and environmental concerns</b> <i>Chairpersons: Prof. Abdelhak Boutaleb &amp; Dr. Jillian Aira S. Gabo-Ratio</i>	
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<b>10:15 - 10:30</b>	Environmental impacts of (Zn-Pb-Fe and Cu) ore deposits mining and associated wastes: A case of northeastern Algeria <i>A. Boutaleb et al.</i> <i>University of Science and Technology-Houari Boumediene, Algeria</i>	123
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10:45 - 11:00	CO <sub>2</sub> and Hg soil gas survey at Telomoyo geothermal prospect area, central Java, Indonesia <i>H. Agung et al.</i> <i>Jurusan Teknik Geologi, Indonesia</i>	133
11:00 - 11:15	First record on some copper showings in northern Algeria <i>O. Kolli et al.</i> <i>University of Science and Technology-Houari Boumediene, Algeria</i>	134
11:15 - 11:30	Refining spatial data with the analytical hierarchy process for minerals prospecting <i>D.V. Faustino-Eslava et al.</i> <i>University of the Philippines, Philippines</i>	135
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13:00 ~	- Departure for post-conference fieldtrip -	

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2	Geochemistry and mineralization of rare earth element bearing Mushgai Khudag deposit, south Mongolia <i>B. Batshugar et al.</i> <i>Kyushu University, Japan</i>	140
3	Hydrothermal activity of Zayiteing deposit in Thabeikkyin area, Myanmar <i>K. Ikeda et al.</i> <i>Kyushu University, Japan</i>	144
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5	Characteristic of gold mineralization in the Goyot Ulaan gold deposit, southern Mongolia <i>J. Maeda et al.</i> <i>Kyushu University, Japan</i>	153



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10	LA-ICPMS analysis of nickel laterite profiles from the Infanta laterite deposit, Palawan, Philippines: Insights into the geochemical behavior of Sc and other REE in weathered nickel laterite <i>J.A.S. Gabo-Ratio et al.</i> <i>Kyushu University, Japan</i>	174
11	A reinterpretation of the stratigraphic and structural controls on gold mineralization in the Paracale gold district, Camarines Norte, Philippines <i>K.L. Queaño et al.</i> <i>Apex Mining Co., Inc., Philippines</i>	177
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14	Petrography and geochemistry of the volcanic and mantle sections of the Samar Ophiolite Complex: Evidence for a supra-subduction zone origin <i>J.M.R. Guotana et al.</i> <i>University of the Philippines, Philippines</i>	184
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16	Petrologic and geochemical characterization of the Sabtang xenoliths <i>G.T.V. Valera et al.</i> <i>University of the Philippines, Philippines</i>	191



## Epithermal mineralization at the Teine mine, southwestern Hokkaido, Japan

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### Introduction

The southwestern district of Hokkaido has produced valuable amounts of gold, silver, lead as well as zinc metals. This significantly accounts for an important portion of the mineral production in Japan. These resources are related with the many Neogene epithermal ore deposits, such as the Teine, Toyoha, Todoroki and Chitose mines in this area. Most of the mines in this district had closed down during the past 30 to 50 years due to the exhaustion of ores including the Teine deposit.

The Teine mine had 10.4 ton of Au and 62.6 ton of Ag resources with 6.0 Ag/Au ratio. Other metal production produced 7,560 ton of Cu. The mine was in production from 1932 until 1971 (Shikazono et al., 1990). Previous works had been done on the geology, mineralogy, structural geology and metallogeny of the mineralized district as well as on the Teine deposit. Despite these previous studies, the occurrence and associated ore minerals in the Teine deposit is still interesting to study since there are various kinds of ore minerals is present in this deposit.

This study attempts to update the association of ore minerals and to clarify the formation conditions of the Teine mine. Determination of ores mineral assemblages is based on the study of samples collected during field works in some deposits around southwestern Hokkaido and from the Hokkaido University Museum collection. A combination of microscopic, electron-microprobe and BSE-based image analyses of polished and doubly polished thin sections

were used to evaluate the assemblages of ore minerals.

### Geological – Mineralogical Overview

The geology of the southwestern Hokkaido area with its relation to the mineralization has been described in detail in Bamba (1977), Watanabe (1990, 1989, 1987, 1986), Yajima (1979), Ishihara (1974), Yahata (2002) etc. Based on its geotectonic setting, Hokkaido is divided into three geologic units: the west, central and east Hokkaido (Figure 1) which are bounded by the Sapporo – Tomakomai lowland belt and the eastern margin of Tokoro – Toyokoro tectonic belt (Minato et al., 1965 in Yajima, 1979). Southwestern Hokkaido is geologically the northern extension of the inner zone of northern Honshu (Figure 2).

Epithermal veins of Pliocene age (or younger) are distributed in Southwest Hokkaido. The Sapporo-Iwanai district (including Teine deposit) is situated at the junction between the Kuril and northeast Honshu Arcs. In this respect, the arc-arc junction is one of the most suitable sites for vein type mineralization (Watanabe, 1990). Neogene volcanic and volcanoclastic rocks are predominant in the district while Cretaceous and Paleogene granites, rhyolites and sedimentary rocks are scattered in limited areas.

Thick volcanic formations of the Miocene period which constitute the “green tuff region” occur on top of the basement rocks of Paleozoic to lower Mesozoic strata. Yajima (1979) divided west Hokkaido into three sub-provinces based on the nature of the sediments a