First Circular

IAVCEI

Commission on the Chemistry of Volcanic Gases

Gas workshop in Hokkaido, Japan, May – June 2020

Website: https://www.facebook.com/CCVG.IAVCEI/
**Invitation**

On behalf of Commission on the Chemistry of Volcanic Gases (CCVG) of the International Association of Volcanology and Chemistry of the Earth’s Interior (IAVCEI), we are pleased to invite the international geochemical community working on volcanic gases to participate the 14th CCVG workshop in Hokkaido, Japan, in May-June 2020.

Main aims of the workshop are to share and discuss recent developments in observation techniques, results and interpretations. Three core activities of the workshop will be: (1) gas composition measurements using direct sampling and sensor techniques, (2) plume measurements remote sensing techniques, and (3) soil degassing surveillance.

The workshop will include two days of scientific meetings followed by three days of field observations. The field observations will be made at Usu volcano and/or Tarumae volcano (selective), and Tokachi volcano.

**Scientific Program**

We hope the conference will be an opportunity to represent a wide range of scientific activities around the study of volcanic gases. As a guide, we aim to organize the presentations around the following topics: (1) geochemistry of magmatic gases and fluxes, (2) new observational techniques, (3) atmospheric chemistry of volcanic plume, and (4) interpretation and modeling of volcanic processes with complementary datasets.
Field campaign:

1. Direct sampling of gas/fluid (Tarumae, Usu and Tokachi)
2. Volcanic gas composition measurements using Multi-GAS or other sensor systems (Tarumae and Tokachi)
3. Plume measurements using UV remote sensing techniques such as DOAS and SO₂ camera (Tarumae and Tokachi)
4. Measurements of diffuse soil degassing especially CO₂ (Usu)

General Information

Hokkaido is the northernmost and second largest island in Japan (Fig. 1). The capital of Hokkaido is Sapporo city. The population is more than 5 million; the area is about 80 thousand km². Hokkaido is known as the coldest region in Japan. The temperature in May-June is 10-25°C. In contrast to other regions in Japan, Hokkaido is not likely to be affected by the rainy season in June-July. The climate is dryer than other parts of Japan as well.

Fig. 1. Map of Japan and Hokkaido.
The common way to travel to this island is by airplane. The main airport named ‘New Chitose Airport’ is located at Chitose, next to Sapporo city. The airport and the city center of Sapporo are connected by train. However, a lot of cities can be accessible only via roads.

There are many mountains and volcanic plateaus at the center of the island, including active volcanoes such as Tokachi, Tarumae, Usu and Meakan. During this workshop, the field observations will be made at Tarumae, Usu and Tokachi. On days 4 and 5, attendees choose Tarumae (for plume and fumarole observations) and/or Usu (for soil CO$_2$ and fumarole observations) for their measurements.

**Tarumae volcano**

![Fumarole A](image1)

![Fumarole B](image2)

Fig. 2. Scenery of fumaroles A and B at Tarumae volcano, Japan.

Tarumae volcano is an andesitic volcano located at southern-west parts of Hokkaido, belonging to the Shikotsu-Toya national park (Fig. 1). The altitude is 1041 m a.s.l. This volcano has a lava dome (cover photo) and two active fumaroles (named A and B) around the dome (Fig. 2). Last eruptions were phreatic ones in 1978, 1979, and 1981. It will take about one hour by feet to reach the fumaroles from a parking lot.
The fumaroles (A) emit high temperature (500-600°C) gases. They are easy to reach and feasible for direct gas sampling and Multi-GAS. The SO₂ flux from the fumaroles (A) is estimated to be 2-5 tons/day, suited for measurements by the walking traverse or SO₂ camera.

The fumaroles (B) locates opposite side of the dome from fumaroles (A). The temperature of fumaroles (B) is 300-400°C; the SO₂ flux from the fumaroles (B) is estimated to be less than 0.1 tons/day. Because of the slope, these fumaroles are relatively tough to reach. Direct gas sampling and Multi-GAS measurements are feasible at fumaroles (B). The walking traverse will be a good option to measure SO₂ flux, while The SO₂ camera measurements may not be able to be conducted because of the location of the fumaroles.

Usu volcano

Usu volcano is a dacitic volcano formed at the rim of Toya caldera in western Hokkaido (Fig. 1). The altitude is 737 m a.s.l. Usu volcano has erupted frequently with intervals of 20-30 years and recent eruptions occurred in 1978 and 2000. We plan to make the fumarolic gas sampling at I-crater fumarolic area and the soil CO₂ flux survey at the surrounding area. The I-fumarolic area locates at the foot of the dome formed by the 1978 eruption and was the location of the 2nd CCVG gas workshop in 1985 (Giggenbach and Matsuo, 1991). The highest temperature is still about 400°C but the fumarolic gases are >99.5% H₂O with very low CO₂, SO₂ and H₂S. SO₂ flux measurements will be very difficult because of the low SO₂ content. At this location, Hernandez et al. (2001) observed a precursory soil CO₂ flux increase prior to the eruption in 2000. We will walk about 30 min from a summit stop of a cable car to the fumarolic field.
Tokachi volcano

Tokachi volcano is located at the center of Hokkaido. The altitude of this volcano is 2077 m a.s.l. The main rock type is andesite. Tokachi volcano has two craters: 62-2 crater and Taisho crater. The latest eruption occurred at 62-2 crater in 1989. It will take about 2.5 hours by feet to reach Taisho crater from a parking lot. Around Taisho crater, the fumaroles are located on a steep slope but are accessible. The temperature of the fumaroles is about 300°C. The direct gas sampling and Multi-GAS measurements are feasible. The SO$_2$ flux from the fumaroles around Taisho crater is estimated to be about 200 tons/day. The plume is often grounded but can be measured by walking traverse or SO$_2$ camera. 62-2 crater is located next to Taisho crater. The fumarolic areas reside in 62-2 crater but it is often difficult to reach. The Multi-GAS would be the option to measure the gas composition. The plume is S-rich; the SO$_2$ flux from this crater is estimated to be about 200 ton/day. The walking traverse or SO$_2$ camera could be conducted to measure the
SO₂ flux. The parking lot and car roads are often windward side from the craters; however, there are still a few chances to measure the SO₂ flux by car traverses if the wind direction is desirable.

**Logistics**

The local organizing committee is confirmed by representatives from GSJ, Univ. of Tokyo, and Tokai Univ. The fee is estimated to be about 1300–1400 USD per person for 8-days activities (including conference, field observations, and transferring) based on 60 participants. As many of the costs associated with the conference and the field excursions are fixed, costs will increase if we have less than 60 participants. We are currently working on sponsorship for the workshop to offset costs.

**Local organizing committee**

Ryunosuke KAZAHAYA (JMA/GSJ), Hiroshi SHINOHARA (GSJ), Masaaki MORITA (GSJ), Toshiya MORI (Univ. of Tokyo), Takeshi OHBA (Tokai Univ.)

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Important dates (tentative)

July 2019 – Second Circular

November 2019 – Pre-registration / Abstract submission open

January 2020 – Abstract submission close

February 2020 – Registration close

References:
