

# Distribution of high concentration carbon dioxide in Tashiro upland of Mt. Hakkohda, Japan

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In the gas hole of Tashiro upland in Mt. Hakkohda, the concentration and the spout mechanism of high concentration carbon dioxide in the gas hole must be made clear. Moreover, it became an urgent problem to make carbon dioxide concentration distribution clear over the area except the gas hole. The carbon dioxide concentration of the gas hole bottom reaches 24. About 2040f carbon dioxide was detected in the ground of 40-60 cm under the surface. Finally, it was concluded that the carbon dioxide concentration became high concentration along the crack at the underground. And it is deduced that underground water is flowing along the crack.

## Introduction

The death accident of the Self-Defense Force member by volcanic carbon dioxide occurred in July, 1997, in the gas hole of Tashiro upland in Mt. Hakkohda. The gas hole which released high carbon dioxide attracted attention, after this accident. The concentration and the spout mechanism of high concentration carbon dioxide in the gas hole must be made clear from the viewpoint in case of prevention protection against disasters. Moreover, it became an urgent problem to make carbon dioxide concentration distribution clear over the area except the gas hole.

## Purpose

The purpose of this study is to deduce the formation of the gas which gushes from the underground by the continuous measurement of the oxygen and carbon dioxide concentrations in the gas hole, and also to clarify concentration distribution map by the measurement of the carbon dioxide concentration in ground in 250 spots around the gas hole, and finally to estimate crack at the underground.

## Result and discussion

The weather observation and the continuous measurement of carbon dioxide and oxygen concentrations in the gas hole showed the following:

- 1.The carbon dioxide concentration of the gas hole bottom reaches 24and the oxygen concentration then is 13
- 2.The relation between the carbon dioxide concentration and the oxygen concentration of the gas hole has the straight line relation of an inclination -0.345. It shows that the gas, which is made up of approximately 100 arbon dioxide, mixes with 75vol air under the ground and is to be gushing.
- 3.There is a cave in the gas hole and gas with 15uarbon dioxide concentration is flowing at the 4 liter/min flow rate from there.
- 4.It is said to that the wind velocity at the time of the accident was calm and then it is expected that the carbon dioxide concentration in the gas hole was 15-24

Carbon dioxide concentration was measured in ground in 250 spots near the gas hole. Generally, the carbon dioxide concentration in ground is 1-2. About 20\$arbon dioxide was detected in the ground of 40-60 cm under the surface. We conclude the following:

- 1.Carbon dioxide concentration in ground is distributed over three areas.
- 2.The carbon dioxide concentration in ground gas becomes high in the summer and becomes low in the spring and the autumn.
- 3.Carbon dioxide was 25pontained in ground near the spring spot.

Finally, it was concluded that the carbon dioxide concentration became high concentration along the crack at the underground. And it is deduced that underground water is flowing along the crack.