**Kanagawa International Science Fair 2018**

School Name

Chuo University Yokohama High School

## Poster Presentation 1

Title (English)

The method of making bismuth metal crystals big and beautiful

Title (Local Language)

ビスマス金属結晶を大きく綺麗に作る方法

Presenter

Nanako Yamagami and Hana Fujita

Abstract


It is difficult to make Bismuth metal crystals “big and beautiful” in the way found on the Internet. In that way, solid bismuth are heated in the stainless pot to melt into liquid bismuth and metal crystals are picked from melting bismuth in the pot. However, crystals obtained in that way were not “big and beautiful”. And so, the way of cooling was examined and modified.

Melting bismuth was cooled in two ways.

The first was to cool bismuth more rapidly with ice. It turned out to be as expected. “Big and beautiful” crystals were not obtained. Moreover whole bismuth in the pot became solid more quickly.

The second was to cool bismuth gradually. In this way, melting bismuth in the stainless pot was put into the earthen pot. “Big and beautiful” crystals were expected because the thermal conductivity of the earthen pot is lower than that of air. The unexpected happened. “Big and beautiful” crystals were not also obtained in this way. It was pointed out that the temperature of the earthen pot was low.

The second way was modified. Melting Bismuth in the stainless pot was put into the heated earthen pot. This way enabled us to obtain “big and beautiful” crystals. Moreover whole bismuth in the pot took a longer time to become solid.


Section

Standard

Category

Chemistry

## Poster Presentation 2

Title (English)

Supercooling state

Title (Local Language)

過冷却状態

Presenter

Ryusuke Wakamatsu

Abstract


Temperature of liquid falls below its freezing point, but liquid sometimes does not freeze. This phenomenon is called supercooling state. Even though temperature of water in this state goes down 0 ºC, the water does not turn into ice. It starts freezing when a piece of ice is dropped into it.

However, cooled water does not always become supercooling state. In this study, conditions of cooled water were examined and the results of the experiment were analyzed from the following two perspectives.

The first is constituent parts of water. The tap water became supercooling state 10 out of 22 trials (45%). The ion exchange water became supercooling state 8 out of 15 trials (53%). These results indicate that the ion exchange water become supercooling state easily. It is suggested that ions in water become the core to freeze water.

The second is quantity of water. Less than 100 ml of tap water became supercooling state 5 out of 9 trials (56%), and more than 100 ml of it became this state 5 out of 13 trials (38%). Less than 100 ml of ion exchange water became this state 3 out of 4 trials (75%), and more than 100 ml of it became this state 5 out of 11 trials (45%). These results indicate that the large quantity of water is more difficult to become supercooling state than small quantity of water. It is expected that differences of temperature between parts of water causes water freezing.


Section

Standard

Category

Chemistry