Influence of Calcium chloride on frost columns

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The purpose of this research is to investigate the effect of calcium chloride on frost columns. In order to begin the investigation, an environment which allows the growth of frost columns was made. Frost columns grow when the air temperature is below 0℃, the temperature inside the dirt is above 0℃, and the dirt must be moist. To meet these conditions, the cool incubator was set below 0℃, and an instrument to incubate the dirt(Kanuma pumice) was made. After adjusting the temperature inside the cool incubator, soil particle size, and the temperature of the water used for incubation, the conditions for the growth of frost columns were observed. Next, the effect of calcium chloride on frost columns based on its molar concentration was researched. As a result, frost columns were observed when the cool incubator was set at -10℃, and took 4 hours for it to be detected. After applying calcium chloride upon the frost columns, the lowest molar concentration of calcium chloride in the dirt to prevent the growth of frost columns was 12.9×10-3mol/L.

Keywords: Frost columns, Calcium chloride

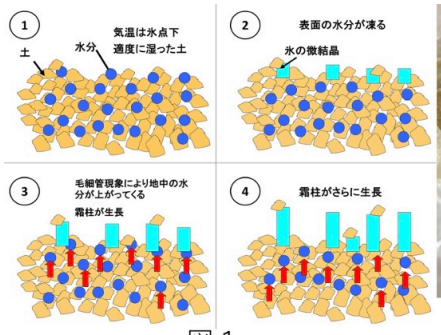

図 1

図 3

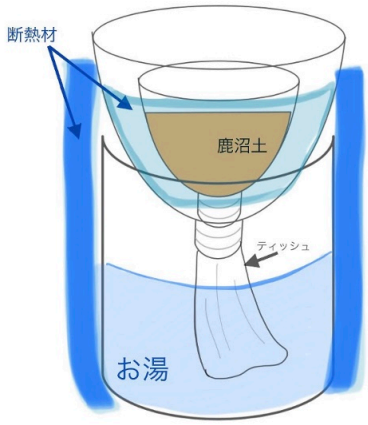

図 2 霜柱作成装置

出典: (NGKサイエンスサイト)

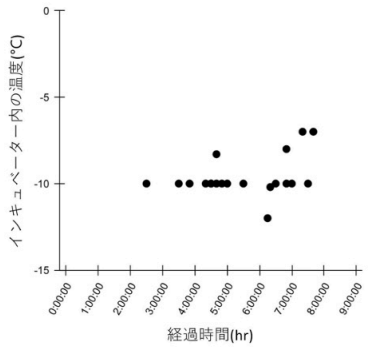

図 4 室温と経過時間の関係

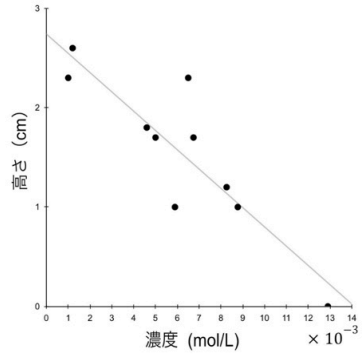

図 5 塩化カルシウムの濃度と霜柱の高さの関係

