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# New theory on the cause of global warming

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## ABSTRACT

A peculiar thermal property for $CO_2$ doesn't exist and is a question of degree on gas elements, the expression makes a wrong. Boyle Charles law give the thermal properties of gases. Liquids happens from solid of atom and molecule with specific heat ($C_p$) of 27.3j at 0 K when a elongation between atoms reaches 1% limit and goes to gases. The fact exists in the periodic table. Relation between elongation (α) and the temperature (Tg) provides the equation below 0°C. $C_p$ vs Tg gives −1% limit to prove the existence of 1% limit. $C_p$ increase accompanied by $1\times10^{-2}$ cal per 1K from 0 K. Both 1% limit arrive $\alpha C_p$ = constant, which makes a clear the mechanism of $C_p$ on $CO_2$ and air. Shape of gases molecule makes flight to increase a fixed volume when temperature rise shown as Boyle Charles law. $C_p$, dependence on temperature of $C_p$ and molecular weight in $CO_2$ (flight angle of 66 degree, air of 48 degree), cause global warming and water of high $C_p$ are supporting them. A wave power generation is effective for stopping extinguish of an iceberg.


## KEYWORDS

Specific heat;
Global warming;
Boyle charle's law;
Entropy;
Gas constant.

## INTRODUCTION

It has been thought that global warming cause mainly by carbon dioxide with the greenhouse effect. The thought of greenhouse effect by specific gases loses the ground because keeping warm of sea water does not imply, which gives a great influence for global warming but has been left out. It is obvious that a temperature of air over a warm current becomes higher than one of a cold current. Traditional theory needs to construct once more by implying the keeping warm of sea water. The greenhouse effect by specific gases[6] like $CO_2$ does not exist because Boyle Charles law works without exception, too. It should deal with as a question of degree on gas elements because gases have greenhouse effect including air. Consequently, it need to clarify what $CO_2$ with heavier and higher $C_p$ than air makes to warm surface of sea water. Here is shown the essence of heat for the cause of warming. The element of the materials on the earth are composed of atoms, molecules and compounds. If a heat quantity caused by infrared rays is given a element, a expansion happen in all element without exceptions as shown in the existence of the melting point($T_m$). It has not been made a clear understanding of the essence of heat. It is obvious that thermal properties e.g. specific heat, thermal conductivity and thermal expansion are scattered without connection. The happening elongation in element has been clarified through thermal behavior of polymer[1,2]. They are classified in two sort. One is given by thermal movement between atoms and the other is mechanical one. The latter has a larger expansion than the former, which is proportional to temperature, too. First a elongation starts by thermal movement, but the movement stops when it reaches 1% elongation ratio from 0°C If a heat quantity adds furthermore, it happens mechanical movement so that it changes from vertical direction to horizontal. SI units adopts as a work load for calory units, which is given the transformation of,

**1cal* = 4.186J* = 4.186w.sec** **(1)**

Where * is $K^{-1}.mol^{-1}$ and it is omitted as follows A relation between a kinetic energy and a heat quantity shown as equation (1) may show to connect between a mechanical movement and a temperature. A elongation deals with to include a shrinkage because both sides are reversible relation. In case of shrinkage, the heat quantity of share releases. A elongation and a shrinkage at element means to come and go of heat quantity. Gases and liquids appear from the stop of thermal movement, which temperature of turning point is called as Tg (the glass-transition temperature). Gases at room temperature are supplied from their solid which a elongation rises up to Tg from 0 K. After Tg, a gas element separates pieces further from a connecting state of liquid when it reaches a boiling point. Gases can handle as an extension of liquids. It may suggest as follows how gases and liquids happen from 0 K. A distance between atoms of element shrinks in proportion to decreasing temperature, which element links together at 0 K as if they were combined. A element, which actually is a distance between atoms, expands by adding a heat quantity from 0 K, the direction of elongation is given toward a line that link the center of them. Although it elongates to radiates on all sides, the pressure happened between elements fixes in the direction of elongation. If a elongation of the radial direction keep to continue, gases wouldn't happen because the size of them grows up only. The appearance of gases and liquids means that the element itself has a motion such as a spin from a fixed elongation.

## RESULT

Boyle Charle's law is shown in PV= Rt. Where P is pressure, V is volume, R is gas constant and t is temperature (K). A volume of gases increases in a fixed value when a temperature rise. The equation gives $\Delta V/V = \Delta t/t$. Where $\Delta V/V$ is volume expansion ratio replaced 3α which α is the linear coefficient of thermal expansion. In other words, gases expands with a constant elongation to keep a given heat and a shrinkage releases it. Elongation (α) means to function thermal and mechanical properties of gases. It appears to cause elongation betweens atoms as follows.

### The relation between Tg and elongation(α) in below 0°C

The relation between Tg (°C) and elongation (α)[1] is given from 0°C as:

$$\alpha \times Tg = 1\% \qquad (2)$$

Where α×Tg is the elongation ratio. The equation of thermal elongation is given as follows:

$$\alpha = \frac{\text{elongation rate}}{t} \qquad (3)$$

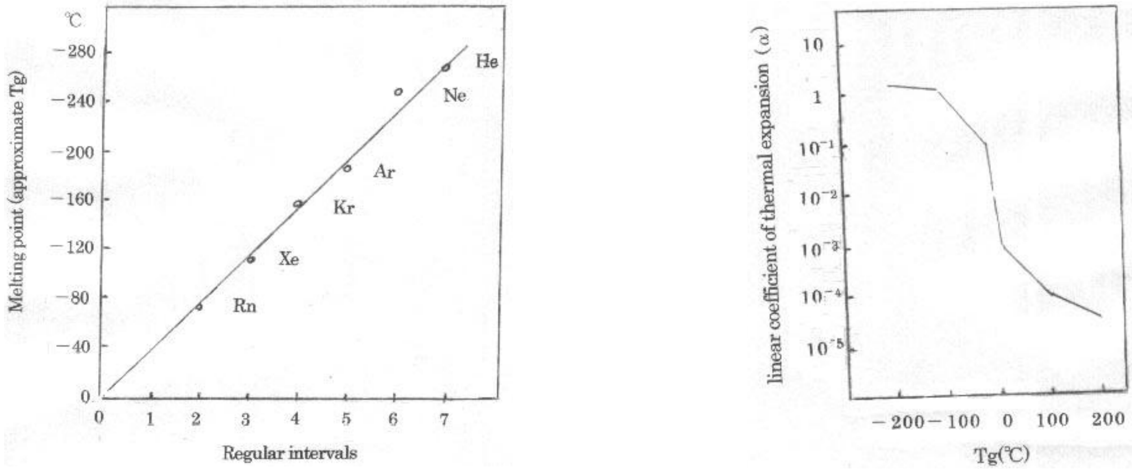
where t is temperature (°C) and elongation rate is a ratio of the expanded length to length of element. In case of below 0°C, Tm (approximate Tg) among gases at 0 family element in the periodic table is dotted on a line from °C to 0 K, which consists of 7 block having a regular intervals 39°C as shown figure 1a. Because 1% limit of elongation given over 0°C exists in each block and the elongation(α) increases in proportional temperature, equation of below 0°C is given as:

$$\alpha = 1\% \times Tg(°C) \qquad (4)$$

where Tg(°C) is an absolute value. This is conformed to connect specific heat later. Figure 1b shows a diagram of α vs Tg(°C) that link two equation over and below 0°C. From these facts, the thermal properties introduced in the essence of heat are given through α and Tg. For example, Thermal conductivity in metal applies with small α in thermal movement side. It can think that a happening elongation by a heat discharges it after traveling in a metal, going back its original state. As Tg of below 0°C also is proportion to α, it can guess from α whether a gasification is difficult or not. It may express plainly, for example, a gasification happens easy because a element of lower Tg has a larger α.

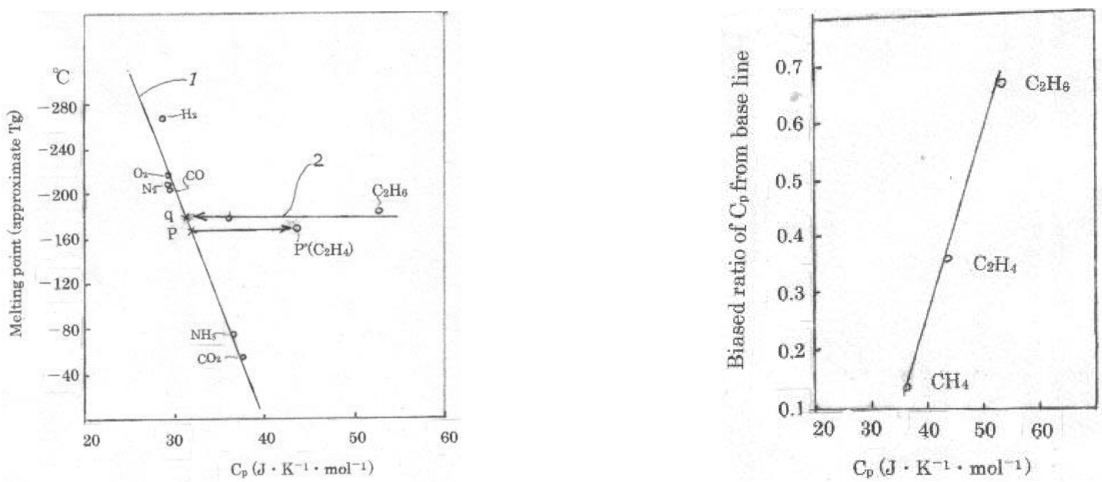
### The relation between specific heat ($C_p$) and α

Specific heat consists of constant pressure ($C_p$) and constant volume ($C_v$), here uses $C_p$. The relation be-




**(a)** **(b)**

**Figure 1 : The relation between α and Tg. (a): The orderly melting point among gases at 0 family element in the periodic table. Figure shows that Tm (approximate Tg) among gases is dotted on a line from 0°C to 0 K and near each block divided into 7 such as He (−269.7°C) of No.7 block is near −273°C. Each block is given as 273°C/7=39°C. Because 1% limit of elongation exists each block, first block is given as 1%39°C = α. α of second block increases like 1%2×39°C (78°C)=α. Consequently a optional temperature gives equation (4). A regular intervals in figure can replace with α, too. Each element belongs to a different electron shell. There is only a little different between Tm and boiling point on the whole that is a characteristic in 0 family element. Tg given a sign of Tm can consider jumping to Tm immediately. (b): A diagram of α vs Tg(°C) connecting up and down 0°C. A diagram shows a transformation compressing the upper value due to a wide extent. The equation over 0°C provides α×Tg(°C) =1% Because in less than 1°C is an inflection point, it cannot use from 1°C to 0°C with indefiniteness.**




**(a)** **(b)**

**Figure 2 : Relation between $C_p$ and Tg. (a): Figure shows Tm (approximate Tg ) vs. $C_p$ among the gas molecules[3], which gives a base line 1. The gradient of a straight line is obtained from any value on the line. {upper $C_p$(28.0)−lower $C_p$(38.0)}/{Tg-280°C│-Tg│-40°C│}=−4.16%J, or −1% cal.. From the result, next equation is given $C_p$ = c+ 1% Tg(K). c is estimated as 273×$10^{-1}$ J =6.53cal at 0 K from line 1. Tg may show as ordinary temperature (t) because the equation is formed by 1% limit of elongation of basic point. (b): Figure shows biased ratio to line 1. The line 2 shows the gas molecule diverged from the base line 1. An example of calculation is given from $C_2H_4$ as follows. Divide the difference of $C_p$ between p' and p on line 1 by $C_p$ of p', that is (43.63−32.0)/ 32.0=0.363. The line of biased ratio indicates to start from q. Where q is a fictitious starting point of line 2**

tween $C_p$ and α is given as follows. Per 1°C, $C_p$ is a specific heat quantity and α is a elongation rate. If α is a lower value, $C_p$ becomes a higher value to need more heat quantity. Tg vs $C_p$ among the gas molecules[3] was found to has a gradient of =−1%.and the value of $C_p$ exists as 273×$10^{-1}$ J at 0 K. Equation between $C_p$ and Tg (K) is given as:

**$C_p$(cal.) =6.53+ 1%Tg (K)** (5)

(Figure 2a).

This proves the existence of 1% limit of elongation in below 0°C. From equation (2) and (5) arrives next equation in over 0°C.

$$\alpha C_p = (6.53\times10^{-2} + 10^{-4}\,t\,(K)) / t(°C) \quad (6)$$

Tg replaces to t for use of general purpose. where α is a partial value not to mean total one of gas molecule. Gases takes stable state at constant temperature and kinetic one in increasing temperature shown as flying state later. Equation (6) is given as each α without total. The latter is given from equation (2). If a temperature of gases doesn't change, equation can use for a comparison of α or $C_p$ because the right side of equation is constant. Although α of solid, liquids and gases has a different value, comparison of α in each state can be applied because there is 1% limit of elongation. The difference gives to reach either fast nor slow up to the limit. Methane etc are out of a base line. These exception show on a line 2 in figure 2b. It means to happen from a difference of symmetrical structure of molecule.

## Flight of gases molecule makes their thermal and mechanical properties

The existing thermal equation explains on gas as follows. If a heat quantity ($C_p$dt) gives a gas, it is shown as follows.

$$C_p\,dt = C_v\,dt + (C_p - C_v)\,dt = dU + Rdt \quad (7)$$

Where U is internal energy. A state of gases can be classified into two types. One is stable state with constant volume and another is kinetic state in a changing volume shown as a flight of molecule. A gas molecule, e.g. $O_2$, $N_2$ and $CO_2$, seems to have a shape of itself as shown figure 3aII. When temperature rises, the tip of molecule's shape is folded under because of kinetic elongation between atoms. It causes increasing space through movement of bending direction of molecule. Elongation between atoms (α) in expanding direction makes a flight of molecule up to a giving temperature as shown figure 3bIII set. Then the gas goes back a stable state again as shown figure 3bI. The giving heat quantity ($C_p$dt) consume both the flight ($C_p$−$C_v$) dt and the increasing temperature ($C_v$dt). The gas constant can understand in flight domain of molecule with ($C_p$−$C_v$).

Because R is about 2 cal and $\frac{C_p}{C_v} = \frac{5}{3}$ is known, $(C_p - C_v)/C_v = 2/3$, is obtained. From equation (6), $\alpha_f/\alpha_s = 3/2$, is obtained. Where $\alpha_f$ is α of a flight and $\alpha_s$ is a stable state. Here, $\alpha_f$ is the length of hypotenuse(y) and $\alpha_s$ is one of the base (x) in figure 3bII. Next equation is given as:

$$y \cos\theta = x \quad (8)$$

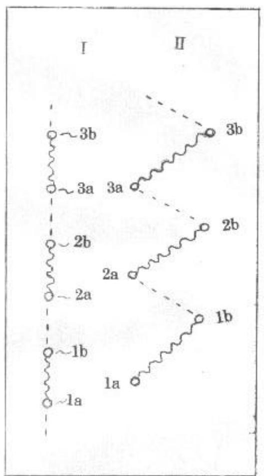
Where θ is the angle of tip. From equation obtains that the angle of flight by air is 48 degrees and $CO_2$ is 66 degrees at 300 K. Although the angle indicates the magnitude of $C_p$, those change according to temperature. If a angle of molecule becomes higher, the dependence on temperature increases. The value is given as dy/dθ=tanθ/cosθ, from y cosθ=2. In case of $C_p$, x of equation (8) express 2 cal in flight on the opposite. The dependence of temperature on $CO_2$ becomes 3.3 times high than air by $CO_2$ (66°)/air (48°) = 3.3. The existing equation supports this method (Figure 3b). A absorption test by infrared rays has a tendency to evaluate the result in dependence on temperature of $C_p$ which gives higher value. The reason which $C_p$ of $CO_2$ is higher than air causes flexibility of a tip.

## $C_p$ of materials on the earth

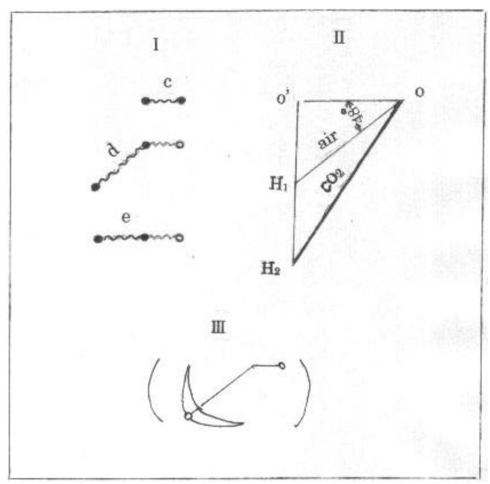
α of liquid is lower than gas because a movement of atom is restricted from tight structure in comparison with gas. It means that $C_p$ of liquid is higher than gas. The difference between $C_p$ of solid (the surface of earth) and water are given from different atom movement with thermal or mechanical function. Mechanical $C_p$ is higher than thermal side to need heat equivalent to more momentum. $C_p$ of water is about 4~5 times value than solid[5] and air given as 0.2375 cal converting g. into mol. A temperature of mixed gas is given from total of each $C_p$ proportional distributed in concentration of the gas. In case of $CO_2$, if it contains perfect in air, $C_p$ of mixed gas can pay no attention to influence due to a little concentration like 379 ppm[6] in the year 2005. Since $CO_2$ is 1.48 times the weight of air, a heavy generating $CO_2$ near the ground takes for a long time to disappear through a diffusion to air. A comparison of diffusion is given from Graham's law, That is, $\frac{D(CO_2)}{D(air)} = \sqrt{\frac{29.6}{44}} = 0.82$, where D is diffusion coefficient and molecule weight is value of calculation. $C_p$ of $CO_2$ is 1.27 times the value of air (Figure 3b). If a generating $CO_2$ is staying on the ground, it means to make a temperature increase about 0.27°C by transferring of a heat from $CO_2$. If a concentration falls fifty percent, it will show about 0.13°C. It suggests how gas weight and $C_p$ is important. Furthermore, the warming needs a medium of keeping warm with higher $C_p$ to increasing temperature. That is water such as seawater of ocean and lake. The seawater of ocean has a gradient temperature in depth, which a higher making temperature in the surface stays a stable condition and the flow of current minimizes the diffusion further. These condition make the warming promote. This indicates that the measures for sea water is the main point.

## Cooling measures

There are passive and positive methods for the measures which the former decreases a generating $CO_2$ and the latter cools the surface of the ocean. The warming is warning to disappear of a polar iceberg rapidly than Antarctic side. A increasing temperature of seawater causes a disappearance of iceberg The great ocean circulation of the earth is known, which circulation is composed of a surface current and a deep current. The warming surface current by $CO_2$ is sinking near Greenland to form deep current. Stopping extinguish of an iceberg needs to cool the sea of near Greenland immediately if there are any possibility. A wave power generation generates electricity by wave. For example, the ship which the bottom fell out was made for up-and-down motion of wave to moves a turbine using a compression and a expanding of air. It got to generate electricity 67000 kw[7]. From equation (1) is obtained that 16 tons of seawater happens down of 1°C per an hour. This way gives to release heat quantity replaced by working which a kinetic energy of wave consumes to move a turbine.




(a)




(b)

**Figure 3 : $\alpha$ vs $C_p$ in flight of molecule and dependence of temperature on $C_p$. (a): Figure I shows a arrangement of each atom of gases at 0 K, e.g. $O_2$ and $N_2$ shown as a and b, arrange a linear, which a chain is a distance between atoms and a dotted line is one between molecules. II shows elongate a distance between atoms from each other repelling by a heat quantity from. (b): Figure I shows a changing elongation of atom when a volume of gas increases by rising temperature. The elongation take three steps. Although a element saturated electron like He provides ideal movement with $C_v$ = 3.017cal, molecules increase about 2 cal.. such as $O_2$ is 4.994cal and $CO_2$ is 6.87cal[4]. The difference seems to happen from a different gas shape of atom and molecule. Therefore in the case of molecule starts flying as shown figure Id after running of about 2 cal in a stable state of figure Ic and then goes back in a stable state of Figure Ie. ($C_p-C_v$ )of flight shown as gas constant (R) is given such as $O_2$ is 1.995 cal and $CO_2$ is 2.02 cal at room temperature[4],which value handle as 2 cal as follows. Because $C_p$ of $O_2$ is 7.03 cal ($N_2$ is 6.97cal) and $CO_2$ is 8.96cal[3] and, those integer can explain three steps as follows. Because $C_p$ of $O_2$ and $N_2$ is nearly air is shown as $O_2$. 7cal of $O_2$ = 2 cal (Figure Ic) + 2 cal (Figure Id ) +3 cal (Figure Ie). Ideal gas state of $O_2$ is given as 2 cal (Figure Id)/3 cal (Figure Ie), $CO_2$ is 2 cal/5 cal in the same way. If $\alpha$ replaces with $C_p$, Figure II shows each the magnitude. o–o' is $\alpha$ of Figure Ie. But the hypotenuse in figure II can use both of $C_p$ and $\alpha$ having the opposite property because of the relation of both sides. Here, $O_2$ is $\alpha_f/\alpha_s$ =3/2 and $CO_2$ is $\alpha_f/\alpha_s$ = 5/2 but a ratio of $C_p$ is given the opposite. The dependence of temperature in $CO_2$ becomes 3.3 times high than air by $CO_2$ (66°)/air (48°) =3.3.Next existing equation supports with the same result (3.2 times) for this method. $C_p$ vs t is given as follows[4]; $O_2$ = 6.148 + 3.102 × $10^{-3}$ t−9.23 × $10^{-7}$ $t^2$. $CO_2$=6.214 +1.04×$10^{-2}$t−35.45×$10^{-7}t^2$, That is $CO_2/O_2$=3.2 at 10°C up or 100°C up. $C_p$ of the dependence of temperature is a value in one step, it does not gives total $C_p$ of molecule, which gives a lower value.**

## DISCUSSION

A fixed expansion of gases cannot explain by only active movement of gases molecule. If a movement would be only vibration or rotation, increasing of volume might not happen. It needs to fly with a fixed direction like gases molecule mentioned above, which could explain reasonable at the first time for Boyle Charles law. Entropy starts to put zero at 0 K. Because entropy apply relatively, it is no mistake but it is given the heat of 27.3j. If there were not a heat in gases molecule at 0 K, elongation could not be proportional to Cp near 0 K because of any necessary heat for movement between atoms. 1% limit of elongation given as just one seems to make the value of near integer, which gas constant (R) is given such as $O_2$ is 1.995 cal and $CO_2$ is 2.02. A absorption test by infrared rays might make the target in dependence on temperature of $C_p$ given higher value. $C_p$, dependence on temperature of $C_p$ and molecular weight in $CO_2$ cause global warming and water of high $C_p$ are supporting them. A peculiar thermal property for $CO_2$ doesn't exist, the expression is wrong for thought of the warming. A wave power generation is effective to consume kinetic energy without potential one.

## CONCLUDION

Gases expands with a constant elongation($\alpha$) to keep a given heat and a shrinkage releases it. Therefore, the greenhouse effect which a special gas only can hold a heat is wrong. $\alpha$ functions thermal and mechanical properties of gases. $\alpha$ connects to elongation between atoms having 1% limit of elongation. Liquids happens from solid of atom and molecule with $C_p$ of 27.3j at 0 K when a elongation between atoms reaches 1% limit and goes to gases. The fact exists in the periodic table. The equation below 0°C provides $\alpha$= 1%×Tg (°C). $C_p$ vs Tg gives−1% limit to prove the existence of 1% limit, which is given as $C_p$(cal) =6.53+ 1% Tg (K). $C_p$ increase accompanied by $1\times10^{-2}$ cal per 1K from 0 K. In case of over 0°C, both 1% limit arrive $\alpha C_p$ = $(6.53\times10^{-2} + 10^{-4}$ t(K)) / t(°C) If gases is in the same temperature, each $\alpha$ and $C_p$ can be applied for a comparison, which makes a clear the mechanism of $C_p$ on $CO_2$ and air. Shape of gases molecule makes flight to increase a fixed volume when temperature rise. $C_p$, dependence on temperature of $C_p$ and molecular weight in $CO_2$ (flight angle of 66 degree, air of 48 degree), cause global warming and water of high $C_p$ are supporting them. A wave power generation is effective for stopping extinguish of an iceberg.

## METHOD

$\alpha$ should obtain from a gradient of a straight line for elongation rate vs temperature. If one point measurement is done, $\alpha$ will give a smaller value[8]. A measurement of below 0°C is advised by volume method. $\alpha$ is an approximate 1/3 to the cubic coefficient of expansion. The cubic coefficient of ice was reported[5] as $1.125\times10^{-4}$ (temperature:−20°C~ -1°C). Tg is obtained as $-3.75\times10^{-3}$ (°C) by putting the value to the equation of below 0°C ($\alpha$=1%×Tg). As the calculating Tg is nearly −1°C,the equation means to be reasonable. $C_p$ of 300 K given from equation (6) is 3.18, which obtained from value of equation ($3.53\times10^{-3}$) divided by $\alpha$=1 /(3×300 K). This means 3 of $C_p$ to need a increasing temperature ($C_v$ dt), which shows in equation (7).

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