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Global Warming Can Be Protected by Promotion of CO_2 Assimilation Using NO_x

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Abstract

The earth is warmed up by the heat evolved by the burning of fossil fuels releasing carbon dioxide. On the other hand, the plant is growing by absorbing heat and carbon dioxide by carbon dioxide assimilation. Earth warming comes from the too much heat evolution by burning of fossil fuels and too less heat absorption by plant growth. Global warming can be protected by promotion of plant growth, by promotion of CO_2 assimilation, by promotion of CO_2 absorption and heat absorption using NO_x produced in the burning process.

Keywords: Nitrogen oxide; NOx; Carbon dioxide; Carbon dioxide assimilation; Global warming; Nutrient N

Introduction

The plant is growing by absorbing carbon dioxide and water making carbohydrate and oxygen absorbing energy. This reaction is called CO_2 assimilation and fix CO_2 and absorb heat. The plant grow fixing CO_2 and absorbing heat. The earth is warmed up by the heat evolved by the burning of fossil fuels. In this burning process much NO_x is produced. NO_x is a good nitrogen fertilizer when dissolved in rain. Global warming can be protected by promotion of CO_2 assimilation, by promotion of plant growth, by promotion of CO_2 fixing and heat absorption using all NO_x produced in the burning process. CO_2 assimilation is a reverse reaction of burning of fossil fuels.

Carbon dioxide assimilation produces carbohydrate (glucose) and oxygen absorbing heat 114 kcal

Assimilation:

$CO_2 + H_2O + 114\ kcal \rightarrow 1/6\ C_6H_{12}O_6 + O_2$

Burning:

44 g; 18 g; 114 kcal; 30 g; 32 g

When burning reaction, left going reaction ← is predominant, earth warming is predominant. When CO_2 assimilation reaction, right going reaction → is predominant earth cooling is predominant by enough absorption of carbon dioxide and heat by carbon dioxide assimilation, earth can be cooled down.

Carbon dioxide concentrations increase annually, in 1750, 278 ppm, in 1986, 350 ppm, in 1996, 357 ppm, in 2000, 372 ppm, in 2010, 390 ppm, in 2014, 387 ppm in 2015, 397 ppm. This is due to the predominant production of CO_2. We must increase the absorption of CO_2 by CO_2 assimilation. To increase the CO_2 assimilation we must increase the concentration of nutrient N, nitrogen fertilizer, NO_x.

Best method to protect global warming is the promotion of growth of plant and plankton. To promote the growth of plant, the supply of nutrient nitrogen and phosphorous is most important [1,2].

CO_2 assimilation at rice field. Rice produce 430 kg rice at 1000 m^2 field fixing 1470 kg CO_2 and absorbing heat 3.8×10^6 kcal without nutrient N and P, no rice is produced. CO_2 assimilation at forest, wood grow by eating CO_2, nutrient N and P. CO_2 assimilation at sea, weed and plankton grow by eating CO_2, nutrient N and P. Without nutrient N and P, no weed and no plankton grow. At no weed and no plankton sea, no fish can live. Nutrient nitrogen such as nitrogen oxide (NO_x) is produced much amount at the burning process of large amount of fossil fuels. NO_x turn into nutrient N, nitrogen fertilizer, by dissolving in rain water and promote the CO_2 assimilation.

NO_x is hated as environmental pollution gas and not good for health But no report as to the sickness caused by NO_x is reported.

By the complete use of nitrogen oxide for carbon dioxide assimilation and promotion of plant growth, we can absorb CO_2 and heat evolved by the burning of fossil fuels.

Production of NO_x

Nature has natural systems to change N_2 to nutrient nitrogen. By the high temperature at fire place for cooking, warming up of room by burning of wood, by thunder storm, by forest fire, by forest burning, by bonfire, following reactions proceed.

$1/2\ N_2 + 1/2\ O_2 \rightarrow NO - 21.6\ kcal$

$2NO + O_2 \rightarrow 2\ NO_2 + 13.5\ kcal$

$3NO_2 + H_2O \rightarrow 2\ HNO_3 + NO$

NO_x (mixture of 90% NO and 10% NO_2) is produced and dissolved in rain water, giving nutrient nitric acid ion NO^{3-} Produced. NO^{3-} ion is a natural nitrogen fertilizer and promote the growth of plant and plankton.

In 1 L rain water, 0.8 mg ammonium ion and 0.44 mg nitric acid nitrogen, total 1.2 mg of nitrogen are contained in 1970. As 1200 mm water fall in one year, 120 L of rain fall in in 1 m^2. 15 kg nitrogen in 1

hectare area are given as fertilizer to all area irrespective mountain, field or sea. Old agriculture such as rice production was carried out without synthetic fertilizer. Old proverb say that many thunder storm year gives good harvest.

In such way, use of nitrogen and recycle of nitrogen are done for 10 thousand years. The equilibrium of burning of plant (CO_2 generation) and production of plant (CO_2 absorption), and the equilibrium of heat generation and heat absorption were maintained.

Amount of Produced CO_2, Evolved Heat, Fixed CO_2, Absorbed Heat and NO_x

As civilization advances, people use fossil fuel like oil, natural gas and coal. Large amount of CO_2 was released. Many reports on the production of CO_2 and effects of CO_2 on climate and how much CO_2 was fixed by land plant and sea weed [3-20]. Large amount of NO_x is liberated in the process of burning of fossil fuels, In 2010. Fossil 1.4×10^{10} t was burned and carbon dioxide 4.4×10^{10} t was produced. As C/N ratio [21-22] of plant is around 5/1-50/1(average 25/1). NO_x 1.4×10^{10} t × 1/50 = 2.8×10^8 t is estimated to be produced. Plant is growing by eating CO_2 and nutrient N by the ratio of CO_2/N 5/1-50/1(average 25/1). One N can fix 5-50 (average 25) carbon dioxide.

Carbon dioxide evolved in whole world is 4.4×10^{10} tone in 1 year. By land plant $10^{-20} \times 10^{10}$ tone carbon dioxide is fixed and by sea plankton $2^{-3} \times 10^{10}$ tone CO_2 is fixed by carbon dioxide assimilation. The CO_2 assimilation is promoted by the increase of nutrient N and P. The most available nutrient N is NO_x. Therefore we should use all NO_x produced by burning as it is produced. We should not eliminate NO_x. Nature look likes set up the amount of NO_x to balance the loss of burning material (fossel) and increase of burning material (plant) by promoting the growth of plant by produced NO_x.

Fossil fuel 1.4×10^{10} t was burned at whole world in 2010 and about 4.4×10^{10} t CO_2 was produced and 2.5×10^{15} kcal is produced and NO_x 2×10^9 t is estimated to be produced. If we use this all NO_x 2×10^9 t, we can fix CO_2 5×10^{10} t ($25 \times 2 \times 10^9$ t). This amount is almost same as 4.4×10^{10} t (CO_2 produced in 2010). We can protect global warming by promotion of CO_2 assimilation by using NO_x.

Amount of Wood, CO_2, NO_x

Total wood weight in the world is 700×10^8 tone. Tree grow 1-2% annually then annual CO_2 absorption is $7^{-17} \times 10^8$ tone. Annual CO_2 fix by land plant is $(10^{-20}) \times 10^8$ tone and annual CO_2 fix by ocean plant is $(20^{-30}) \times 10^8$ tone. Ammonia production of world in 2010 is 1.8×10^8 tone. Fix of nitrogen by bioorganic compound is 1.8×10^8 tone. NO_x produced by exhaust gas is 0.4×10^8 tone. We must promote the production of wood such amount to compensate fossil fuel burned by using all NO_x produced.

NO_x is a Good Fertilizer and NO_x Elimination is Stopping CO_2 Assimilation and Fish Production

Example 1: As mentioned at previous paper [1], Setoinland sea (sea between Shikoku and Chugoku in Japan) was filled with sea weed and fish before 1980. Two news about the red sea (red plankton grow) at near hatchery fish plants at Kagawa prefecture, and much water weed grow at Biwako lake were reported. These were special event at special district. But Japan Government established Environment Ministry. This Ministry established strict rules to inhibit the growth of all plankton and weed effective for all over Japan by eliminating all NO_x, nutrient N, nutrient P. By this rule, Setoinland sea changed dramatically since 1985. Sea weed do not grow. Plankton do not grow. Nori growing plant stopped. Fish decreased. Fisher man decreased. Carbon dioxide assimilation decreased. Fixing of carbon dioxide and absorption of heat decreased. Setoinland sea became dead sea. Area of Setoinland sea is 47000 km^2. 4.7 million times wider than 1 hectare. If we can do the assimilation with the same efficiency as rice field, by giving sufficient N and P supply. 1.47 t × 47 × 10^5 = 69 × 10^6 t of carbon dioxide is absorbable and 114 × 47 × 10^6 = 5.3 × 10^{12} kcal heat is absorbable. And 47 × 10^6 t of fish will be produced.

Example 2: At all Japan sea area: Where Kuroshio (poor N, P nutrient sea current) is running: Rocky-shore denudation is seen. Fish decreased. Especially Pacific saury (sanma) Tuna (maguro), Bonite (katsuo), Sardin (iwashi) decreased, Bream(tai), Sea eel (anago) Shell fish like Oyster (kaki), Basket clam (shizimi), Short-neck clam (asari), decreased. All these fish were cheap than meat before 1970. Japanese can live longest by eating these fish [23-29]. But now fish is much more expensive than meat since NO_x and nutrient P elimination rule. We Japanese may loose long life record.

Example 3: The very recent news that almost all Japanese pond smelt and cap died at Suwa lake Nagano, Japan by the lack of oxygen [30,31]. The reason of lack of oxygenlack of CO_2 assimilation (provide much oxygen), lack of weed and vegetable plankton, by the lack of nutrient nitrogen and phosphorous.

Example 4: Old Japanese proverb say. Mizu kiyokereba uosumazu. Where water is very pure, no fish can live. In no nitrogen, phosphorous water, no fish can live, no weed, no plankton can live.

NO_x Elimination Process is Promoting Global Warming

The facility like power station have denitration process. Flue gas is reacted with ammonia and NO is converted to N_2 gas

$4NO + 4NH_3 + O_2 \rightarrow 4N_2 + 6H_2O$

2×10^6 t; 1.13×10^6 t

Equimolar amount of ammonia is required to eliminate NO.

The production of nitrogen oxide by persons operation in Japan is two million tone. If destroy NO_x by ammonia, 1.13 million tone ammonia is necessary. This amount is 2 times of nitrogen fertilizer used in Japan. To make ammonia 1.13 million tone, 0.2 million tone hydrogen gas is required. To make 0.2 million tone hydrogen, butane 0.64 million tone is required. As the result, 1.76 million t carbon dioxide is released. This is a huge promotion of global warming.

$C_4H_{10} + 8H_2O \rightarrow 9H_2 + 4CO_2$

0.64×10^6 t → 0.20×10^6 t 1.76×10^6 t

$N_2 + 3H_2 \rightarrow 2NH_3$

In Japan very special rule about the incinirator was set up in 2002. By this rule, incinirator must be burned at higher temperature than 800°C by adding excess fuels to keep higher temperature. Operation of this high temperature incinilator is using much excess fuels releasing much varbou dioxide.

Summary

Global warming can be protected by promotion of CO_2 assimilation by using all NO_x. evolved at burning process.

Diesel engine car is encouraged. Diesel engine car has 30% high fuel efficiency and produce 10 times more NO_x than normal car. This NO_x can promote the CO_2 assimilation.

Catalyst to eliminate NO_x should not be accommodated in a car.

Fuel efficiency of the car without catalyst is 30% higher and the car without catalyst produces more NO_x.

Elimination process of NO_x in power station, petro chemical station and iron work station should be stopped. Elimination action of NO_x is retarding the CO_2 assimilation. Elimination process use much fossil fuels. Therefore elimination action is double promotion of global warming.

Use of tri polyphosphate as detergent additive is recommended.

Promotion of foods like rice, wheat, cone and potato production by giving sufficient N, P fertilizer is recommended.

Because excreta is best food for plant. Ocean dumping, field dumping and forest dumping of excreta are recommended.

Elimination process of nutrient nitrogen and phosphorous and organic compound in drainage should be stopped.

The earth is warmed up by the heat evolved by the burning of fossil fuels. We can protect the global warming by promotion of CO_2 assimilation, reverse reaction of burning, absorbing CO_2 and heat using NO_x.

Estimated amount of buried fossil. Oil is 100 years, natural gas is 200 years, coal is 200 years. We must save the consumption of fossil fuel considering how can we drive a car and airplane after 200 years. How electricity is generated. Fossil is limited precious treasure. We should not use fossil for elimination of NO_x. We must use produced NO_x for promotion of CO_2 assimilation.

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