



The Effect Of The Sun Roof Of Global Warming

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ABSTRACT

A research on the study on The Effect Of The Sun Roof Of Global Warming in the laboratories of Physics Academy Maritim Belawan on August 24, 2016 - September 7, 2016. Materials used in this study are: 7 color plastic mica and 7 pieces of rubber bands, The tools used in this research are 7 and 2 pieces of fruit thermometer stopwatch. From this research, can inform the public, should buy or wear a canopy roof tiles and white houses, green, and purple because, from the research results, the three colors have a temperature with low radiation. So as to reduce global warming.

Kata Kunci

Global Warming, Color, Roof Tiles, Radiation

INTRODUCTION

Our background research on "the effect of the sun roof of global warming" In an effort to reduce the impact of climate change both anticipatory and reactive, and mitigate the negative impacts that global warming is caused by the use of the roof of the house .To keep the earth's temperature remains stable. We often clayey person or canopy roofs the color is different. At that time, we thought appeared to examine the relationship between color, radiation and Global Warming, so that people know what colors are good to be used as the roof of the house in order to reduce the impact of global warming .

Colourbody emits radiation in the form of electromagnetic waves. Radiation of electromagnetic waves emitted color object depends on the color temperature of the object. in addition, this study also could add insight to the public about how to reduce global warming and give information to wear or buy a house roof or canopy color low temperature. In addition to the color on the house roof or canopy our research could also be applied in the use of color in the glass on the window glass on the house or car.

The Problems about The Effect Of The Sun Roof Of Global Warming, namely :

1. What kind of colours that emit high temperature?
2. What kind of colours that emit low temperature?
3. What is the relation between colours, radiation, and global warming

This research of purposes, namely :

1. To determine how much influence the color of the rise in temperature that affect global warming

2. To determine what colors are most in enhancing global warming
3. To find out what colors are most in enhancing global warming

This research is expected to provide the following benefits: Provide information to the public to wear or buy a house colored roof or canopy color with a low temperature, so that low radiation and reduced or low global warming.

Definition

The largest source of energy on earth comes from the sun. Solar energy can be down to earth in the form of light emission. Such a light beam is called radiation. Radiation is the emission of energy by the emission of continuous surfaces. Emission or radiant energy in the form of electromagnetic waves that can propagate without an intermediary substance. Radiation can be through a vacuum. That's why the sun's radiant energy emitted can be up to the earth.

It turns the surface of all objects can emit energy and can also absorb energy. What is the perceived difference if during the day you wear Hitam and wearing a white shirt? Of course, wearing black clothes will be noticeably hotter than wearing a white shirt. That is because the black-colored surfaces absorb and emit more energy. In contrast, white colored surfaces absorb and emit less energy.

Josef Stefan (1835-1893) states that the amount of energy per unit time broad unity emitted by the surface of an object to its environment satisfies the equation:

$$P = e \sigma T^4$$

With :

P = energy per unit area per unit time (J/ m²s = watt/ m²)

e = coefficient of emissivity (not dimensionless)

σ = common constant (5.672 x 10⁻⁸ watts / m²K⁴)

T = absolute temperature (K)

E prices depend on the state of the surface of the object, which is the harshest and color of objects. For a perfect black surface e = 1, while perfectly white surface e = 0. So the value of e is 0 ≤ e ≤ 1. Since P dimensionless joules / m²s or watt / m², to determine the amount of energy emitted by an object is determined by equation:

$$W = e \sigma T^4 A t$$

With:

W = the energy emitted by the surface of the object (joules)

A = the surface area of object (m²)

t = time or duration of energy emissions (second)

If compared to the environment temperature T_o, the equation would be:

$$W = e \sigma (T^4 - T_o^4) A t$$

The radiation source is divided into two natural sources of radiation, where the natural sources of radiation has existed since the universe was formed, and the radiation emitted by natural sources of this so-called background radiation, examples of

natural sources of radiation is the source of cosmic radiation, the radiation source terrestrial (primordial), and a source of radiation in the human body. Artificial radiation sources, newly produced in the 20th century, but has significant exposure to humans. An example is the artificial radionuclides, the plane X-ray, nuclear reactors, accelerators. There are two man-made radiation sources are sources of ionizing and non-ionizing radiation.

Type

Ionizing radiation

Ionizing radiation is a type of radiation that can cause ionization process (the formation of positive ions and negative ions) when interacting with a material.

Examples of radiation include ionizing radiation, namely: alpha particles, beta particles ,, gamma rays, X-rays and neutrons.

a. Alpha particles

Has the size (volume) and a great positive electrical charge and is composed of two protons and two neutrons, so it is identical to the nuclei of helium atoms. Power ionizing alpha particles are very large, approximately 100 times the power of ionization particles 10,000 times the power of beta and gamma ray ionization. Because it has an electrical charge that is greater than the alpha particles can not penetrate the pores of our skin on the outermost layer, though because it has a large size.

b. Beta particles

Has the size and electric charge is smaller than alpha particles. Ionization power of the air ionization 1/100 times the power of alpha particles. Beta particles have greater penetrating power than alpha particles because of its smaller size.

c. Gamma rays

Gamma rays do not have the amount of electrical charge volume and thus grouped into electromagnetic waves. Ionization in the medium power is very small. Not deflected by an electric field that is around, so that the power breakdown is very large in comparison with the penetrating power of alpha or beta particles.

d. X-rays

Has some similarities with gamma rays, namely in terms of the coverage on a medium and its influence by an electric field. The only difference between the two is the process of occurrence. The gamma rays produced from the decay of a radioactive substance that occurs in the nucleus, while the X-rays produced when high-energy electrons striking a metal targets

e. Neutron particles

Neutron particles have a small size and has no electric charge, and has a high penetrating power. Neutron particles can be produced from nuclear reactions between certain elements with other elements.

Non-Ionizing Radiation

Non-ionizing radiation is a type of radiation that will not cause ionization effect when reacting with the material. Which is included in this type of radiation is non-ionizing radiation include radio waves, microwaves (used in the microwave oven and transmitting cellular phone), infrared light (which provide energy in the form of heat), visible light, ultraviolet light (which is emitted by the sun) ,

a. Infrared light

Infrared is electromagnetic radiation of a wavelength longer than visible light, but shorter than radio wave radiation. Infrared light has the characteristics, namely: can not be seen by manusia tidak can penetrate opaque materials, can be generated by components that generate heat, wavelength in the infrared has the opposite relationship or inversely proportional to temperature. When the temperature increases, the wavelength decreases.

b. Ultraviolet light

Ultraviolet light is electromagnetic radiation to gelombang yang length shorter than areas with visible light, but longer than x-small X.

Global warming

Global warming is the increase in the average temperature of the atmosphere, ocean, and land earth. The global average temperature at Earth's surface has increased by $0.74^{\circ}\text{C} \pm 0.18$ ($1.33 \pm 0.32^{\circ}\text{F}$) over the last hundred years. In Indonesia alone based on data dari Pelangi, an institution that focuses on research and mitigation of climate change states that Earth's surface temperature in most parts of Indonesia have increased between 0.5 - 1 degrees Celsius compared to the average temperature between the years 1951-1980, which This increase is mainly due to the increase of greenhouse gases.

Global warming caused by excessive greenhouse effect. The greenhouse effect is an event where the hot sun that has reflected from the surface of the earth, is not fully passed on to outer space but is absorbed and reflected back to the earth's surface. The greenhouse effect is actually very important to keep the earth's temperature to remain stable and warm allowing for the existence of life. Without the greenhouse effect, the earth's surface temperature is now 15°C will be -19°C .

The greenhouse effect caused by the presence of gas contained in the atmosphere, the gases are called greenhouse gases (HFS), gases, especially carbon dioxide (CO_2) and some kind of other gases such as methane (CH_4), N_2O , Ozone (O_3), Chloroflourocarbon (CFC) or better known as freon gases, including water vapor. To keep the earth's temperature remains stable then the greenhouse gas content should not be too less also

should not be too much. If the gas content exceeds normal limits of the earth's temperature will increase causing the so-called global warming.

Impact on the environment

As for the impact of global warming on the environment as follows:

- a. The melting of ice at the north pole and a south pole.

Increasing the earth's temperature caused a lot of icebergs that are polar to liquid.

- b. Rising sea levels.

With the melting of icebergs in the polar indirectly causes the increase of the volume of water in the ocean, this is causing rising sea levels.

- c. Changing the extreme climate

Rising sea surface temperatures and atmospheric that may trigger storms and extreme climate changes. In the southeast Atlantic, for example, in the last decade many emerging new storm like Hurricane Katrina, while in East Asia, Southeast Asia, the Pacific Islands and the west coast of South America, a phenomenon of El Nino and La Nina that caused the season to be uncertain.

- d. Destruction of habitat for flora and fauna.

- e. Given the climate of instability and the temperature makes a lot of flora and fauna habitats being damaged, especially on coral reef habitats and cooler subtropical regions, due to rapidly increasing temperature exceeds the adaptability of flora and fauna lead to a lot of flora and die-impact damage to ecosystems permanent.

Efforts to reduce the impact of Global Warming

Evidence of global warming is already not be denied, but not the time for us to blame each other, it would be better if the thought of a solution of what we can do in order to restore the environment to be like the original. These efforts should start from ourselves (individual) and then to the family and community level.

In general, efforts to reduce the impact of global warming dpat 2 is divided into adaptation and mitigation.

Adaptation

Adaptation is an attempt to reduce the impact of climate change both anticipatory and reactive and reduce the negative impacts caused by global warming. Adaptation example:

- Planting trees in the area of yard or on a large scale can be done by doing reforestation
- Prevent and reduce the illegal logging. Felling of trees must obtain a permit from the forestry office and conducted by selective logging system, and any attempt to carry out reforestation.
- Prevent land clearing by burning bush and forest.
- Creating absorption wells to collect rain water, so avoid flooding.

- As well as using the roof of the house that has more influence on the effect of Global Warming.

Mitigation

Mitigation is an effort to reduce greenhouse gases so as to reduce the impact of global warming. Mitigation measures include

- Reduce the use of spray because most spray still use CFCs for charging high pressure gas.
- Start using air conditioners, refrigerators, dispensers and other cooling equipment that does not use CFCs
- Conserve electricity use for example by using power-saving lights, turn off the computer or TV and not just make it on standby, etc. because most sources of electricity, especially in Indonesia come from the burning of oil, natural gas, and coal.
- Reducing the consumption of meat from livestock, especially cattle, because cattle farming requires a lot of water can reduce the amount of water on land.
- Reduce the use of objects made from plastic.
- Driving with intelligent, that using private vehicles only when really needed, try to drive it in accordance with the capacity of the vehicle, and driving slowly, as proven by a vehicle driving slowly will save more gasoline.

RESULT & DISCUSSION

Place and Time Research

The research will be carried out: Physics Laboratory Academy Maritim of Belawan Medan. When the study will be conducted from August 24, 2016 - September 7, 2016. Materials used in this study are: 7 color plastic mica and 7 pieces of rubber bands, The tools used in this research are 7 and 2 pieces of fruit thermometer stopwatch.

Research Procedure

1. Prepare tools and materials
2. Roll the plastic mica with a thermometer factory, each 1
3. Tie with rubber bands
4. Measure the initial temperature (all the same)
5. Then, every 1 minute is measured and recorded temperature measurements up to 50 times.
6. if the data and make conclusions

Colours	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15
White	35	36	36	37	38	36	35	35	36	36	36	36	33	34	34
Black	38	39	37	38	38	36	36	38	37	38	39	38	36	37	38
Blue	39	40	38	38	38	36	37	37	38	37	38	37	38	36	37

Green	32	39	38	37	39	38	37	37	37	37	39	38	37	36	38
Yellow	37	37	36	36	36	36	35	36	37	36	36	36	35	35	35
Pink	37	39	37	38	37	37	36	37	37	37	36	37	37	36	36
Orange	35	35	34	34	34	35	34	36	35	35	35	34	35	35	34

Colours	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27	T28	T29	T30
White	35	35	36	35	36	35	35	36	35	36	36	34	35	34	33
Black	38	38	39	40	38	39	39	37	37	39	38	35	36	36	36
Blue	36	37	37	38	38	39	38	38	37	38	38	36	36	37	36
Green	37	37	37	37	38	39	38	38	37	37	36	35	37	37	37
Yellow	35	36	37	36	37	38	37	37	35	35	34	37	36	38	37
Pink	36	36	37	37	38	38	37	36	37	36	36	38	37	37	37
Orange	35	35	35	35	35	37	37	37	37	36	35	34	36	36	36

Colours	T31	T32	T33	T34	T35	T36	T37	T38	T39	T40	T41	T42	T43	T44	T45
White	34	35	34	36	37	35	35	34	36	36	35	36	36	35	36
Black	36	37	37	37	36	35	36	36	38	37	38	37	38	37	37
Blue	37	36	38	38	36	37	37	36	36	36	36	36	36	35	38
Green	36	36	38	38	37	38	37	37	37	38	37	37	37	38	38
Yellow	37	38	37	39	38	38	38	37	38	36	36	38	38	37	36
Pink	37	38	36	39	38	39	38	36	37	37	37	36	37	38	37
Orange	37	38	36	36	37	37	37	37	36	37	38	37	37	36	38

Colours	T46	T47	T48	T49	T50	Mean
White	37	35	34	34	35	35,28
Black	38	38	37	38	37	37,36
Blue	36	37	38	36	37	37,10
Green	37	36	37	36	38	37,18
Yellow	37	37	36	37	37	36,58
Pink	38	37	38	37	36	37,06
Orange	36	36	37	38	37	35,86

CONCLUSIONS

The higher the temperature of the color of an object, the higher the radiation and the higher the global influence on warming and vice versa. From this research, can inform the public, should buy or wear a canopy roof tiles and white houses, green, and purple because, from the research results, the three colors have a temperature with low radiation. So as to reduce global warming.

REFERENCE

- Abdul Wahid Wahab Dan Nursiah La Nafie, 2014, *Radiasi* UNHAS Press.
- Asmiyenti Djaliasrin Djalil, Wiranti Sri Rahayu, Retno Wahyuningrum, 2010, *Global warming*. Jurnal, Universitas Gajah Mada, Volume 20
- Davitt Kristina, Yonn-Kyu Song, 2012, 290 and 340 I. *Term of global warming*, *Physic journal*, vol. 13, No. 23.
- Gunandjar, 2014. *Global warming*. Jurnal, Universitas Indonesia, volume 5
- Haitamisya, 2010, *Radiasi*, Jurnal, UNS, Volume 5.
- J. Hankiewicz, S Lewicki, Z Pajak, 2012, *Radiation*, *J. Phys. E: Sei. Instrument.*, Great Britain, 2012.
- Maridi, 2013, *Radiation*. Jurnal UNS, Volume 3.