Short communication

~~HU~~HUMANITY LIVES IN THE COSMIC MICROWAVE.

Abstract. The sun is the source of energy for earthquakes and erupting volcanoes. The sun emits electromagnetic waves in an extremely wide range of wavelengths. There are two mechanisms for converting radiation energy into thermal energy: the absorption-emission spectra of molecules, and the induction heating of electrically conductive materials. A clear and publicly available model of the proposed hypothesis is the kitchen microwave oven. The emitter of the microwave oven is tuned to the frequency of absorption of water molecules. As a rule, this frequency is 2.45 * 10^6 Hz. But an energetically excited water molecule emits in the infrared (thermal) range. Thus, each molecule of water in the microwave oven becomes a heater. The second heating mechanism, induction, is activated when solar radiation encounters an electrically conductive material. For example, an ore deposit. This is how the Earth's core was formed. The Earth's core continues to grow in size as long as the sun shines. Prediction of earthquakes and volcanic eruptions are possible after establishing a correlation between the power and duration of radiation in a certain frequency range of the solar spectrum and the localization of an erupting volcano or earthquake. Having created such a database, it will be possible, by tracking the radiation power of a certain range, to predict the expected localization of an erupting volcano or earthquake. By placing a metal grid in the stratosphere over the site of a proposed eruption or earthquake, it will be possible to at least reduce its intensity.

:[1Bs]Comment

Key Words: Earthquakes; Erupting volcanoes; **Laws** of Thermodynamics; electromagnetic radiation; absorption-emission spectra; high-frequency heating.

INTRODUCTION

The First Law of Thermodynamics in the formulation of Hel~~i~~mholtz sounds like this: Energy ~~is~~ neither arises, nor is destructed, but only gets transformed from one form to another (Prisyazhniuk, 2007). When searching the Internet for an answer to the question: where does the energy of volcanoes and earthquakes

come from, I found only the question: “Where does the huge energy that creates a boiling silicate melt come from? There is no definitive answer to this question yet.”

I propose a hypothesis for billions of years of not disappearing energy sources of volcanoes and earthquakes. This source of energy is the Sun.

A hypothesis becomes a theory only after it has been experimentally confirmed. So let's start with an experiment.

1. MODELING A VOLCANO ERUPTION

Place a raw egg in a glass or ceramic cup or bowl and place it in your kitchen's household microwave oven.

Turn on the furnace at full power to see the model of an erupting volcano more quickly.

You might even hear a "explosion" in a minute.

The strength of the eggshell will determine this.

In any case, you will spend more time cleaning the microwave oven than the experiment did.

What occurred?

~~Take a raw egg, put it in a glass or ceramic cup or bowl, and place it in a household microwave oven that you have in your kitchen. Turn on the furnace at maximum power to observe the model of an erupting volcano faster. In a minute you might even hear an "explosion". This will depend on the strength of the eggshell. In any case, you will clean the microwave oven longer than the experiment lasted. What happened?~~

According to the Boyle-Mariotte Law, Gay-Lussac, and Mendeleev's amendments

$P*V = n*R*T$ (1)where P, T, V, and R, are respectively, pressure,temperature, volume, the universal gasconstant and n is the number of kilogram-molecules of the gas.

The chicken egg contained, among other things, water. As a result of heating the water to the boiling point (we will discuss how the microwave oven works below), it turned into water vapor.One kilogram-molecule of water in a liquid state occupies a volume of 18 liters. But one kilogram-molecule of water vapor at room temperature and atmospheric pressure occupies a volume of 22,400 liters. Thus, the volume of water in the gaseous state increases in comparison with the volume of water in the liquid state by 22400/18 = 1244 times.

A kilogram molecule of tin iodide SnJ_2 weighs 372.5 kg. Specific gravity (mass per unit volume) 5.28 kg/m^3. The boiling point is 720^0 C. At room temperature, a kilogram-molecule of tin iodide occupies a

volume of 70.5 m^3. However, in the vapor state, that is, at 720^0 C, a kilogram-molecule of tin iodide occupies a volume of 22,400 m^3. That is, during the transition from a solid to a gaseous state, its volume increases by 318 times.

As a chemist, I use the database of physicochemical properties of chemicals available to me [2]. Geochemists, geologists, and geophysicists will be able to perform similar calculations based on reference books available to them.

Let us remind you that Avogadro showed back in the 19th century that one kilogram-molecule of ANY SUBSTANCE IN A GASEOUS STATE occupies a volume of 22,400 liters.Let us transform equation (1) into the form

P = (n*R/V)*T(2)

Because the shell limits the volume of the egg, the pressure of water vapor inside increases not only 1244 times but also in proportion to the temperature.This is why the eggshell is ripped by pressure and the contents are thrown onto the microwave oven's ceiling and walls.

~~Since the volume of the egg is limited by the shell, the pressure of water vapor inside increases not only 1244 times, but also in proportion to the temperature. This is why the eggshell is torn by pressure and the contents are thrown onto the ceiling and walls of the microwave oven.~~

It appears to me that the same thing occurs in nature.

In general, any substance or rock in the liquid state takes up more volume than it does in the solid stat

A volcanic eruption will occur if the volume of rock formed during heating (including the melt and gaseous products of chemical reactions) finds an outlet to the Earth's surface and excess pressure is released as a result.

If the melt and reaction products can only push the walls of the "chamber" in which the heating occurs, lowering the pressure, an earthquake will occur.

~~It seems to me that the same thing happens in nature. As a rule, any substance, any rock in the liquid state occupies a larger volume than in the solid state. If the volume of rock formed during heating (including the melt and gaseous products of chemical reactions) finds an outlet to the Earth's surface and due to this, excess pressure is released, a volcanic eruption will be observed. If the melt and reaction products can only push the walls of the "chamber" in which the heating takes place, and thus reduce the pressure, then an earthquake will be observed.~~2. HOWTHEMICROWAVEOVENWORKSStructurally, a microwave oven is a chamber with a high-frequency emitter fixed on the side wall and a disk rotating in the center of the chamber, on which the heating object is placed. The instructions for the microwave oven say that the maximum efficiency of converting radiation energy into temperature is created at the center of the rotating disk.

The emitter of a microwave oven emits an electromagnetic wave, usually at a frequency of 2.45 $*10^6$ Hz. This frequency is resonant with~~to~~ the frequency of natural vibrations of water molecules. Reheated food always contains some water. Absorbing radiation energy, the water molecule goes to a higher energy level $\Delta E = h\nu$,where h is Planck's constant and ν is the resonant frequency.

The water molecule is unable to store energy. Therefore, it uses as much energy as it needs to ensure its movement, and emits the rest, returning to the old energy level.But a water molecule emits in the infrared (thermal) range $3*10^{11}$ - $4*10^{14}$ Hz. Thus, each water molecule becomes a heater and heats ~~up~~ its surroundings. The temperature to which the heated object is heated is determined by the emitter power set by the user (W/s) and the heating duration.

There is another mechanism for heating a substance due to radiation: induction heating is a method of non-contact heating with high-frequency currents (RFH - radio-frequency heating, heating by radio-frequency waves) of electrically conductive materials. Known induction non-contact heating of metal stock materials due to induction eddy currents generated by a high-frequency electromagnetic field. Moreover, such heating ~~is~~ applies~~cable~~ to any metals and conductive materials.

This technique is used for~~:~~ Ultra-clean non-contact melting, soldering, and welding of metal.

Obtaining test samples of alloys.

Bending and heat treatment of machine parts.

Jewelry business.

Machining small parts that can be damaged by flame or arc heating.

Surface hardened.

Hardening and heat treatment of parts of complex shape.

Disinfection of medical instruments.

The walls of a protective chamber made of glass, cement, plastics, and wood are heated; these materials absorb electromagnetic radiation very weakly and remain cold during camera operation.Metal (including molten metal), carbon, conductive ceramics, electrolytes, liquid metals, and other electrically conductive materials are heated.

~~Heating is carried out through the walls of a protective chamber made of glass, cement, plastics, wood - these materials absorb electromagnetic radiation very weakly and remain cold during operation of the camera. Only electrically conductive material is heated - metal (including molten), carbon, conductive ceramics, electrolytes, liquid metals, etc.~~

The liquid metal is intensively mixed due to the emerging MHD (magnetohydrodynamic) forces, up to keeping it suspended in air or a protective gas.This is how ultrapure alloys in small quantities are produced (levitation melting, melting in an electromagnetic crucible).

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3. HOW ENERGETICALLY INTERACTS THE SUN AND THE EARTH

Consider the Sun, which emits an electromagnetic field at an extremely wide range of frequencies and is "fixed" as an emitter in a fixed location in the Solar System.In its orbit, the planet Earth revolves around the sun, exposing its entire surface to the sun during the day.The maximum efficiency of converting high-frequency electromagnetic radiation into heat is at the center of the Earth, just like in a microwave oven.

~~Let us draw an analogy: the Sun, which emits an electromagnetic field in an extremely wide range of frequencies, is "fixed" as an emitter in a fixed place in the Solar System. The Planet Earth revolves around it in its individual orbit, exposing its entire surface to the Sun during the day. Just like in a microwave oven, the maximum efficiency of converting high-frequency electromagnetic radiation into heat is at the center of the Earth.~~

A molecule of any chemical substance has two individual characteristics: an absorption spectrum and an emission spectrum. Let me remind you of a classic example: helium was first discovered in terms of its emission spectrum on the Sun. And only later, after obtaining helium in its pure form on Earth, was it possible to study its absorption spectrum.

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~~emission spectrum on the Sun. And only later, after obtaining helium in its pure form on Earth, it was possible to study its absorption spectrum.~~

Initially, during the formation of the solar system in the center of the Earth, the temperature increased due to those molecules whose emission spectrum was in the infrared (thermal) region. But as metal ores were included in the heated volume (the heating chamber) and their melting took place, the mechanism of induction heating of the smelted metal by eddy currents began to prevail. Thus, the metallic molten core of the earth began to form, whose efficiency made it much more efficient at converting the electromagnetic radiation of the sun into thermal energy. It can be assumed that the Earth's core continues to increase in size as the deposits of metal ores are consumed. And the electromagnetic radiation of the sun continues to supply thermal energy to the melt by the mechanism of induction heating.

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As the creators of chemical kinetics, van'tHoff and Arrhenius~~,~~ showed at the end of the 19th century, the rate of chemical reactions increases significantly with increasing temperature. Taking into account the temperatures and pressures existing in the bowels of the Earth, we can assume the formation of new chemicals with their ~~own individual~~ absorption and emission spectra. Includingemittinginfraredradiation.

4. HOW TO USE THE PROPOSED HYPOTHESIS.To To begin with, I would like to share media information that confirms the hypothesis put forward. In the second decade of November 2022, the media

announced a high-intensity magnetic storm that was to be observed on Earth on November 20. Perhaps as a result of a coincidence, two volcanoes erupted in Kamchatka exactly on November 20, 2022. On November 21, it became known about a~~the~~ volcanic eruption in Indonesia, which led to the need to evacuate 2,000 residents from the volcanic eruption zone. November 22 reported a volcanic eruption in South America.

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~~The development of extra-atmospheric observation methods made it possible to study the spectrum of the Sun in the entire range of electromagnetic waves: from the γ range (X-ray radiation) to kilometer radio waves.~~

It is necessary to collect data for many years on the energy intensity of various frequency ranges of the electromagnetic radiation of the Sun and their change over time. And also about the localization and date of earthquakes and volcanic eruptions. Then compare these data with each other. In other words, find a correlation between earthquakes, volcanic eruptions, and the energy intensity of individual frequency ranges of the Sun's electromagnetic radiation.If such a correlation is found, then the revealed patterns will be a database for predicting earthquakes and volcanic eruptions.

It will be possible to prevent or at least reduce the intensity of earthquakes and eruptions by raising a mobile screen made of metal mesh into the stratosphere in the area of the alleged eruption or earthquake, which will convert high-frequency electromagnetic radiation into heat.The frequency of the electromagnetic radiation that needs to be filtered determines the cell size of the metal mesh.The temperature is around - 500 degrees Celsius at an altitude of 11 to 25 kilometers (the lower layer of the stratosphere).As a result, the grid will be cooled because the energy of electromagnetic radiation absorbed by it will be converted into heat.

~~It will be possible to prevent or at least reduce the intensity of earthquakes and eruptions by raising into the stratosphere in the area of the alleged eruption or earthquake a mobile screen made of metal mesh, which will transform high-frequency electromagnetic radiation into heat. The cell size of the metal mesh is determined by the frequency of the electromagnetic radiation that needs to be filtered out. At an altitude of 11 – 25 km (the lower layer of the stratosphere), the temperature is about – 50^{0}C. Therefore, one can count~~

~~on the cooling of the grid, the energy of electromagnetic radiation absorbed by which will be converted into heat.~~

REFERENCE

1. Prisyazhniuk, Vitaly (Lead Author); Tom Lawrence (Topic Editor). 2007. Laws of thermodynamics. In: Encyclopedia of Earth. Eds. Cutler J. Cleveland (Washington, D.C.: Environmental Information Coalition, National Council for Science and the Environment). [Published in the Encyclopedia of Earth December 18, 2007; Retrieved December 19, 2007].
http://www.eoearth.org/article/Laws_of_thermodynamics

2. Chemist's Handbook, Moskow, Chemistry, 1966, vol. II.