R is the Rock That Shatters the Greenhouse Effect

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The greenhouse effect is hopelessly at odds with basic science. Science says all gases react the same when heated. The greenhouse theorists says, no, some gases act differently. I hold that the greenhouse effect is all bosh. Let me explain.

The greenhouse effect claims that the presence of a greenhouse gas, say, carbon dioxide, raises the temperature of the air above what it would be if it was replaced by, say, oxygen instead. Proponents claim air is a mixture of gases, some are the greenhouse gases, carbon dioxide, water vapor and methane. Most are not greenhouse gases. These are nitrogen, oxygen and argon. It is also claimed that without the trace greenhouse gases the 59 ^{0}F average temperature of Earth would plummet to 0 ^{0}F. We would freeze solid and life would be difficult. Dire things would happen to our world if these gases should increase very much.

Other planets in our solar system with thick atmosphere's like our own planet have completely different gases. Venus was found by space probes in the 1960s to have an atmosphere 92 times as heavy as Earth's and composed of 96% carbon dioxide. It also had a shockingly higher temperature than supposed, hot enough to melt lead and tin. This led the astronomer [Carl Sagan](#) to claim in 1961 that it was a victim of a "runaway greenhouse effect." This was refuted by the scientist [Robert Ian Holmes](#) in 2018. Holmes convincingly demonstrated that Venus's seemingly high surface temperature could be entirely explained without the greenhouse effect. He did this by showing its atmospheric temperature was entirely explained by the simple arithmetic of its mass, density and pressure. The **composition** of Venus's atmosphere played no role. It could have been composed of air like Earth's with the same result: There is no need for a "runaway greenhouse effect." To do this Holmes made use of a simple equation most students of high school chemistry or physics would recognize. It is called the equation of state. How could such a fundamental equation and the theory behind it be overlooked for so long? Sagan had a PhD in a science that makes use of this in the evolution of stars and why they shine at night. How could he have overlooked this? Whenever something irrational happens, suspect politics is behind it.

THE KEY ROLE OF THE NUMBER R

Holmes used observational data to refute Sagan's and others' claims about the greenhouse effect operating on Venus. A different tack will be taken here using the very precise measurements from experimental data taken over the years on the common gases of our atmosphere to test the greenhouse effect. I will do this without any elaborate theory, merely the use of simple arithmetic and some basic concepts of high school science.

The fact that all gases act alike when heated means this in science: The amount of **energy** or **work** going into heating any gas is a number that never changes its value for a unit amount of that gas for each degree of temperature raised. Science calls this constant number, **R**. It is a fraction that can be pictured like this:

$$R = \frac{\text{work}}{\text{amount} \times \text{temperature}}$$

You can think of **R** as being short for **R**esponse of any gas to heating. It has a precise numerical value agreed to by scientists and it is this long decimal, **R = 8.31446261815324**. The units used with it are joules for the numerator and 1 mole and 1 degree Kelvin for the denominator since it is a fraction as can be seen above. For what follows put aside all that detail about the unfamiliar units of joule, mole and degree Kelvin. Just concentrate on the first seven digits of **R** only, **8.314 462**. As it turns out, there are differences between gases when we measure them. So, the experimental values for **R** we get for each individual gas will be different from the others.

The question we want to answer is how much they differ. Are the greenhouse effect advocates right that there are significant differences in each gas's response to heating that imperil our planet, or not?

TESTING WHETHER ALL GASES RESPOND TO HEATING EQUALLY – USING R

What we are concerned with are differences in **R**'s value for the greenhouse gases compared with the non-greenhouse gases. If the greenhouse effect is true, we should find a significantly **lower** value for carbon dioxide's **R** value than for oxygen, nitrogen and argon. Why a lower value, and not higher? The idea is that carbon dioxide for the same amount of energy will create a higher temperature than, say, oxygen. This is another way of saying carbon dioxide is more **efficient**, it takes **less** energy or work to get the same one degree temperature rise as oxygen. So, the numerator you see in the above picture is smaller for carbon dioxide than oxygen for that very reason. So, the **R** value for carbon dioxide must be SMALLER than for oxygen since the numerator is smaller. The same must also be true for water vapor and methane: They must have significantly smaller **R** values, too.

What I am going to give you is the **experimental value** of **R** for each gas in our atmosphere. Each experimental value is completely indifferent to any scientist's claim about reality, regardless how famous or eminent. It comes from a laboratory measurement with an exquisitely accurate device called a calorimeter. Because they are not perfect, calorimeter's have experimental error, which alone should cause some small variation in results from gas to gas. What we are looking for, again, are significant differences, not small stuff.

Science developed over the first few decades of the 20th century progressively more sensitive measurements of three aspects of gases that play a role in determining each

gas's value for **R**. These are called **C_p** and **C_v** and **M**. The first is known as a gas's specific heat at constant pressure, thus the c and p in the nickname above. The second is known as a gas's specific heat at constant volume, thus the c and v in its nickname. **M** means the amount of a gas called molar-mass. You do not need to understand these complicated concepts, just that they give you **R** when used.

Here is the arithmetic: Take **C_p** and subtract **C_v** from it. Then multiply $c_p - c_v$ times **M** and the answer equals **R**. This simple formula is called **Mayer's Law**, named for the physicist who found it. You do not need to understand how and why this law is true, just that in science it is treated as true. For its derivation go here. To make this more visible I am going to show a table where each gas is shown on a line with the difference between these two **($C_p -$ C_v)** and then the gas's **M** value. At the line's end will be the **R** for that gas. Here goes. I will show the so-called greenhouse gases first, then the non-greenhouse gases. On the last line I will show you the experimental values for air. Remember, **R = 8.314462**. Here is the source for the table's data. See Table A-1.

1	2	3	4	5
Gas or Vapor	Formula	$c_p - c_v$ (J/g K)	Molecular Weight	Experimental Value for R = Column 3 * Column 4
Carbon Dioxide	CO_2	0.1889	44.010	8.315
Methane	CH_4	0.5182	16.043	8.314
Water Vapor	H_2O	0.4615	18.015	8.314
Argon	Ar	0.2081	39.948	8.313
Nitrogen	N_2	0.2968	28.013	8.314
Oxygen	O_2	0.2598	31.999	8.313
Air	Mixture	0.2870	28.970	8.314
Average (except air)	–	–		8.314

Notice anything peculiar about the so-called bad guy, carbon dioxide? I don't. It looks like oxygen, argon and nitrogen. The same for water vapor and methane. You would have to go out to the third decimal place to see any difference from the theoretically exact value. Because the data has four place precision, we can only be confident to three decimal places to the right of the digit 8 in the table for R's value. Notice the third decimal place's values vary from 3 to 5 for the six gases. The average of the six is 8.314. So, the **R** for all of these gases is about **8.314**. The smallest **R** value was for argon and oxygen. Both had the greatest "greenhouse effect," 0.001 less than air. Even if either 100% replaced air, it would **not** have a measurable effect on our planet's average temperature. Carbon dioxide had a **R** value **greater** than air, not less. A major

disconnect here, unexplainable by the greenhouse theorists. The small differences between the common atmospheric gases reflects what science means when it says all are alike in response to heating. The wonder then is why all this mischief about carbon dioxide?

Bottom line: Carbon dioxide goes to the same temperature as oxygen, nitrogen and argon when the same amounts of each gas are compared with the same energy when tested under controlled, precise laboratory conditions. The greenhouse fanatics insist that carbon dioxide goes to a higher temperature under these conditions. Any small increase is devastating. If you look at their papers, they never substantiate their claim, they merely assume it is true. It's all bluff and raw assertion. The experimental data shows our atmosphere is insensitive to carbon dioxide, water vapor and methane.

GREENHOUSE GASES DO NOT EXIST

I have just presented experimental data that says greenhouse gases DO NOT raise the temperature of air anymore than anything else. **R** says it cannot. A one degree increase in temperature will result from the same energy input into carbon dioxide as any other gas in air, no more, no less. This is the same result Robert Ian Holmes found for observational data taken from Venus, or any of the other planets with thick atmospheres, such as Jupiter. For those of you who are scientifically inclined, I urge you to look at his scientific essays online. They are readable and provide a lot of history that completes the story.

Now a brief note on something mentioned about our planet being 59 degrees warmer than it should. So, if the greenhouse effect does not operate, what causes that thing? The answer is simple. The weight of our atmosphere causes that 59 degree warm up. If you go deep down into a mine, you will notice the air gets hotter as you go deeper. No sunlight down there, so no greenhouse effect could work even if it did operate as claimed. The greater depth of air creates a heavier column of air than at the surface, causing the temperature to go up as you descend. That phenomenon is what causes the "lapse rate" or observed cooling as one goes up a mountain or heating as we go down a mountain.

The same gas laws that underlie **R** apply everywhere, that is why they are used in astronomy to explain stellar temperatures and the evolution of stars. Remember, there is no pope in science. People are free to choose whatever proposition they wish to believe. Some people do not try to test their propositions. They instead merely look for things that affirm or support their claims. This may be okay when beginning an investigation of some hunch. It is not reasonable in science to assert a proposition without looking for evidence that its exact opposite is true instead. Look back over what was done here. I took Sagan's argument, found its exact opposite, carbon dioxide is **no** different than any other gas, and then subjected that to an empirical test where it could be found false. Powerful evidence of a very precise and accurate nature was brought forward. The limit of experimental error was four digit accuracy as seen in the table and it was NOT rejected as false. This makes Sagan's unexamined hypothesis from 1961 false from the start.

SCIENTISTS SHOULD NOT TRY TO MERELY AFFIRM THEIR PROPOSITIONS

As a scientist, he should not have done this. I am also very curious why the editors of his 1961 Science article did not raise any questions about his unsupported assertion. Afterall, Sagan went to considerable lengths to disprove with facts and data controversial propositions by Fred Hoyle and others. He does not do so with his own thesis stated in column three top on page 855. Why was he allowed such latitude by the referees of that famed journal?

A predecessor to Sagan who was concerned with the warming effect of carbon dioxide was [Guy Callendar](). Beginning in 1938 and continuing to 1961, Callendar's articles emphasized the history of carbon dioxide's radiative effects. Here again is the search for confirmation of a theory, rather than looking for evidence supporting its opposite. Ironically, Callendar's father, Hugh Callendar had pioneered a highly sensitive flow calorimeter that enabled scientists to very accurately measure the specific heats of gases in the 1920s and 30s. I have a textbook in science from 1932, for example, and its table of values have three place accuracy for the specific heats of gases listed in my table above. So, there was no lack of evidence even in 1932 that Callendar's warming effect of carbon dioxide would have proved false and rejected. He did not look for it, so he did not see it.

For both of these men, critical analysis is reserved for others' arguments, and not when they advocated something. Ego gets involved in advocacy and lots of times politics takes hold, too. I believe that is what happened to Sagan. Both ego and left wing politics blinded him, even though he frequently exhorted students of science to do exactly the opposite. It was just too irresistible. Callendar sought an explanation of the ice ages and found carbon dioxide as the culprit. He also found we were helping the cause of preventing one by accumulating it in the atmosphere from our activities. One advocate saw carbon dioxide as a boon for the planet and its occupants, the other saw it as the bane. Neither was being scientific, instead they were advocates of a faulty proposition. Both were funded by government grants during friendly political currents.

The sad part of it all is our federal government's now cynical use of science funding mechanisms to stymie critical studies of climate changes. Just try to get an NSF grant contradicting the greenhouse effect. The government is no neutral body seeking to fund truth. It has its own political interests very often antagonistic to the public which funds its misdeeds. They have been using our tax dollars to fund scientific models of climate change built on associations between carbon dioxide accumulation and temperature change. Well, models are not data nor a substitute for critical analysis. The whole apparatus is based on assumption, never tested, that greenhouse gases exist, and it is going to stay that way no matter which way the political winds blow.

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