

RADIOISOTOPE POWER SYSTEM CONDENSED UNDER SPLIT RING MECHANISM

1. Introduction:

Venus is the closest planet to Earth, not only in distance but also in size and mass. With a radius about 5% smaller, the uncompressed density of Venus works out to be nearly the same as Earth's, implying a similar structure and composition for the body of both planets. However, Venus has a much more massive atmosphere than its terrestrial sibling, with a surface pressure about 90 times higher and a composition predominantly of carbon dioxide which is a minor constituent on the Earth. The surface of Venus is covered with signs of recent or currently active volcanism, but while this may suggest an interior convective activity, there are no signs that it generates a planetary magnetic field or undergoes continental-scale plate tectonics.

Venus has a thick, toxic atmosphere filled with carbon dioxide and it's perpetually shrouded in thick, yellowish clouds of sulfuric acid that trap heat, causing a runaway greenhouse effect. It's the hottest planet in our solar system, even though Mercury is closer to the Sun.

The concentration of elements-Carbon dioxide: 96 percent. Nitrogen: 3.5 percent. Carbon monoxide, argon, sulfur dioxide, and water vapor: less than 1 percent.

A Radioisotope power system drives the Venus lander, it involves a Radioactive core providing electrical power for spacecraft by converting the heat generated by the decay of plutonium-238 (Pu-238) fuel into electricity using devices called thermocouples. This system operates at a temperature of 1000 degrees Celsius, which is comparatively higher than the atmospheric temperature of Venus. So, to cool it we should be placing a condenser system but it puts extra weight and work in case of a liquid cooling system. To overcome this we are using a split ring mechanism which absorbs the heat as

IR radiation and repowers the system by conserving energy to the maximum extent.

2. Radioisotope Power System:

For more than half the century, American space missions have relied on radioisotope thermoelectric sources (RTGs) to allow electrical strength. The high decay energy of Plutonium-238 enables its function as the energy source in the RTGs of satellites, planets, and so on. RTGs are extremely reliable and will offer heating or energy for decades under very harsh circumstances. This is particularly important where solar power is not possible. (Pentland, W., May. 2018)

A satellite was fitted with 3 Multi Hundred-Watt radioisotope thermoelectric sources (MHW RTG). Each RTG includes 24 pressed plutonium oxide spheres and provides sufficient energy to produce about 157 W of electric power in the launch. Together, the RTGs provided the satellite with 470 watts in the launch and would permit operations to continue until at least 2020. (NASA. 1989.) (NASA-NSSDC-Spacecraft-Details. NASA.) (Furlong, Richard R.&Wahlquist, Earl J., 1999)

Voyager 1 owns three radioisotope thermoelectric sources (RTGs) mounted on the boom. Each MHW-RTG comprises 24 pressed plutonium-238 compound orbits. (Furlong, Richard R.&Wahlquist, Earl J., 1999) The RTGs yielded around 470 W of electrical power at the moment of launch, with the rest being dissipated as waste energy. (JPL.) The force production of these RTGs worsens over time (because of the 87.7-year half-life of the fuel and humiliation of the thermocouples), but this business's RTGs can go to support some of its operations until 2025. (JPL. 1989.)

Radioisotope power organizations (RPSs) make energy from the decomposition of radioactive isotopes, such as plutonium-238, which

constitutes the non-fissile isotope of plutonium. Energy made off by the decomposition of the isotope is converted into electrical voltage by thermocouples, allowing steady force within all seasons and through the day and night. Material energy can be applied via pipes to warm systems, freeing electrical power for the functioning of the transport and tools. ((PDF) . NASA/JPL. Oct 2013.) ((PDF) . NASA/JPL. Apr 18, 2006.) Curiosity's RTG is fuelled by 4.8 kilograms (11 pounds) of plutonium-238 oxide provided by the U.S. Division of Energy. (Clark, Stephen, Nov 17, 2011)

3. Split Ring Resonator:

Energy emission is the process by which force, in this form of electromagnetic radiation, is emitted by the hot device in all directions and travels immediately to its point of concentration at the speed of light; thermal radiation does not need the intervening liquid to carry it.

This moment to the cost from exposure to radiative energy is the function of the energy transfer rate. (Furtak, M.&Silecky, L., 2012)

Radiative energy flow and results: ($1 \text{ W/cm}^2 = 10 \text{ kW/m}^2$)

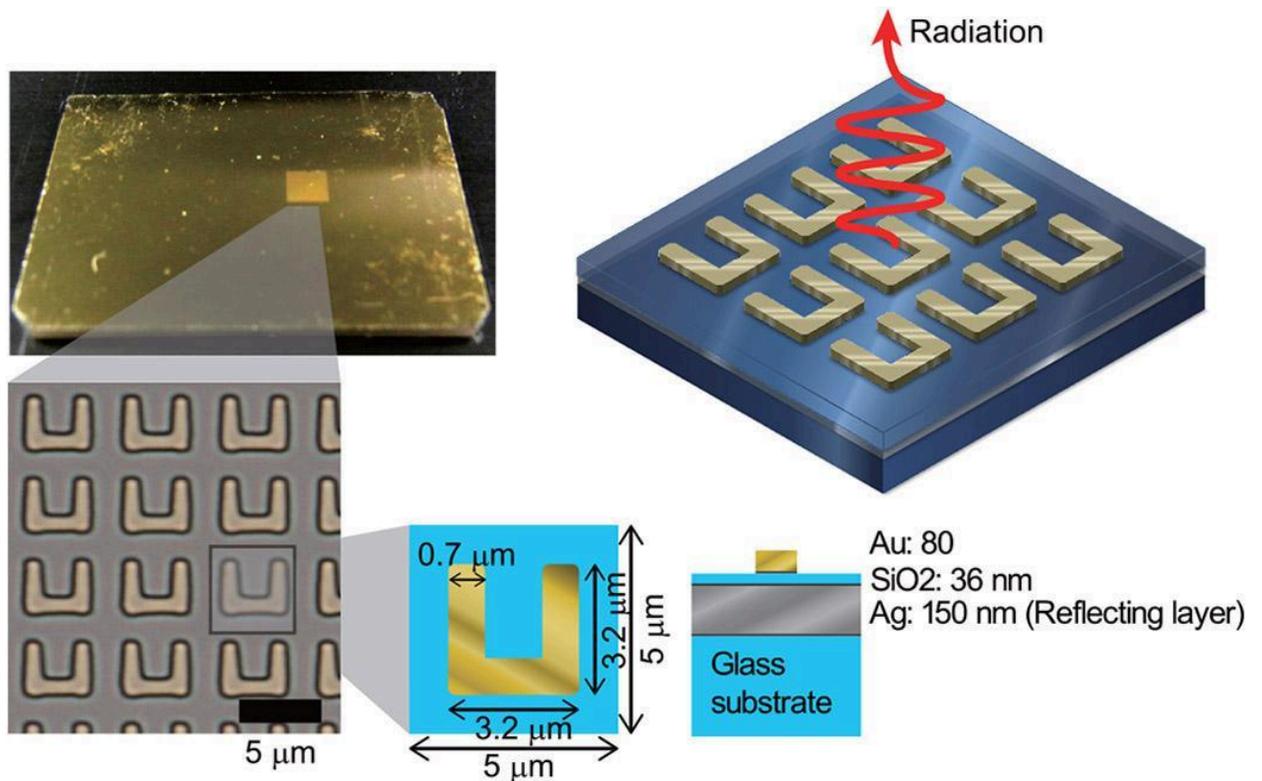
Electromagnetic emission is composed of oscillating electrical and magnetic areas that have the power to transmit energy through the area. This energy propagates as the movement so the crests and troughs of the movement move.

Energy mass systems can keep solar energy in the form of energy in domestically important temperatures for regular or interseasonal durations. Energy storage systems generally utilize readily available materials with high specific energy capabilities, e.g., water, ground, and rock. Well-designed systems will decrease peak demand, move time-of-use to off-peak times and reduce overall heat and cooling requirements.

In general, the shape of a thermal radiation spectrum depends on its temperature. As the temperature increases, the radiation power

increases and the peak wavelength is shifted toward the blue end of the spectrum. A system that has low energy density will be more efficient than one with high.

Until now, TPV systems have been based on microcavity arrays and need deep (i.e., several microns) hole structures on a thick substrate. Advanced dry etching processes are required to achieve these deep-aspect-ratio microstructures and this is challenging over a wide area. In addition, there is no flexibility in such a substrate.



4. Conclusion

The mechanism starts with the continuous decay of the radioactive nuclei of plutonium-238 (Pu-238) from which constant heat is generated, this heat is used by thermoelectric generators to produce energy for the lander system. As it has no moving parts the system is reliable to use. The entire system is preserved in a chamber of stainless steel alloy, which protects it from external factors. The work done by radiated heat constantly increases on the system, instead of disposing of the heat into the surroundings most of the portion is converted into

IR radiation using the Split-Ring resonator, which utilizes this heat energy to power the system. This avoids the placement of a liquid cooling system thus reducing the number of moving parts and work done by the system. This mechanism couldn't increase the efficiency of the thermoelectric generator but on a complete scale, it will be making use of the dissipated energy.

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