

THERMALLY ENHANCED SOLID-STATE GENERATOR

Abstract:

A solid state energy conversion device along with its production methods and systems of use is provided. The device in its most basic form consists of two layers, in contact with each other, of dissimilar materials in terms of electron density and configuration, sandwiched between metal layers, which serve as the anode and cathode of the device. One of the inside layers is made of a stabilized mixture of carbon and an ionic material (carbon matrix). The other inner material consists of a stabilized oxide mixed with an ionic material (oxide matrix). This device takes advantage of the built-in potential that forms across the barrier between the carbon matrix and the oxide matrix. The built-in potential of the device (when not attached to a resistive load at the terminals), which is determined mathematically by integrating the electrostatic forces that have created themselves across the barrier, will rise or fall in direct proportion to the rise and fall of the device temperature (in kelvins). When a load is attached across the terminals of the device, current flows. Depending on the size of the load or the surface area of the device, a reduced current will allow sustained recombination such that the built-in potential and current remains steady overtime. Otherwise, the current curve will fall over time similar to a capacitor device. Experimentation shows that current rises by the fourth power of the temperature factor.

(FIG. 1C)