Long-lived betavoltaic batteries with high power density and high efficiency

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What we are looking for

We are looking for a suitable partner to enter into license deal/co-development partnership

What it is needed for?

Conventional chemical batteries suffer from significant limitations due to their **limited energy storage capacity** and **rapid degradation over time**. **Betavoltaic batteries** overcome these issues by directly converting the energy released through radioactive decay (beta particles) into electricity, providing a **stable and continuous power supply for decades**, depending on the half-life of the radioisotope employed.
The invention is distinguished by an **innovative nanostructured design**, based on the combination of **graphene with black silicon and 3D-printed silicon carbide (graphene/SiC)**, integrated with **charged electret layers**. This unique technological approach enables a **substantial increase in energy conversion efficiency**, exceeding 20%, compared with the few-percent efficiency typically achieved by conventional betavoltaic technologies.

Advantages

- **2–10× efficiency increase** compared to traditional technologies
- Higher overall efficiency
- Reduced battery degradation phenomena

Applications

- MEMS/NEMS devices
- IoT sensors
- Biomedical and aerospace sectors

TRL scale

1 2 3 4 5 6 7 8 9

Chemistry, Physics, New Materials

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