



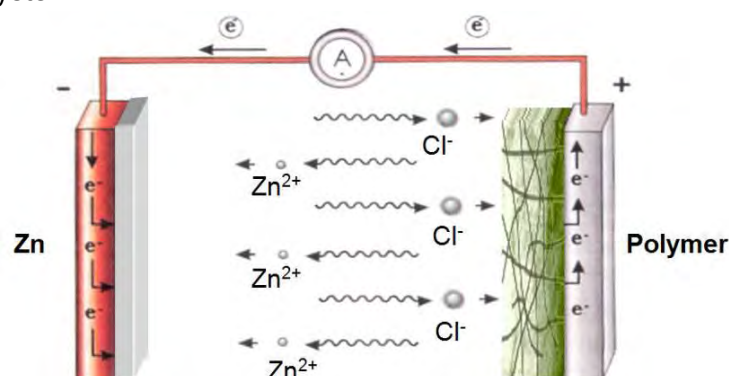
A novel, fast rechargeable zinc battery for hybrid electric vehicle (HEV) and small electric vehicle (EV)

A European Union funded research programme is developing a prototype polymer-zinc car battery which offers significant advantages over current technology. The €3.5 million research project, PolyZion, is funded under the EU Seventh Framework Programme and combines world-class research organisations in creating a novel class of fast rechargeable zinc battery for hybrid electric vehicle (HEV) and small electric vehicle (EV) applications.

Mass introduction of HEVs and EVs is widely expected within the next 10-20 years, driven by rising fuel pump prices, the looming shortage of oil and regulatory commitments towards lower CO₂ emissions. With predictions that the rapid growth of the global market for HEVs and EVs is expected to top \$2 billion by 2015 there is good promise for new battery technologies. However, the currently available commercial battery technology (nickel metal hydride, NiMH) is unable to keep pace with the increasing demand for HEVs and EVs and does not meet power and energy needs. The main competing technology currently under development is the Lithium ion (Li-ion) battery which does perform well in terms of energy and power density, but brings new challenges such as reduced lifetime, high cost, low abuse tolerance and poor low temperature performance, as well as ongoing safety concerns. The only other valid alternative is the lead-acid battery currently being re-invented into new lightweight and more powerful designs, but, still with significant environmental drawbacks.

Zn Polymer Battery: The Alternative

The project combines a new low-cost, air and moisture insensitive and environmentally benign class of ionic liquids, zinc deposits, pulse charge injection and conducting polymers for use in a rechargeable battery system.



Initial Results

Initial lab results are very promising with regards to the performance of Zn polymer batteries in terms of both the power and energy density. Initial results indicate that the Zn/polymer battery ideally lends itself to a HEV application where high power density and good cyclability are important characteristics.

Key features of the Zinc Polymer Battery:

- Low cost construction materials with good security of supply
- Environmentally benign with low environmental impact
- Improved safety performance, due to the use of non-flammable and low toxicity ionic liquid electrolytes.
- Good power density.
- Competitive energy density, in excess of current state of the art NiMH batteries.
- Good cycleability, with the potential to significantly exceed the original targets.
- The project is of 3 years duration and funded under the Cooperation category of the European Union Seventh Framework programme (FP7) http://cordis.europa.eu/fp7/understand_en.html

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