

Sulphur Nanotube Cathode Cells

LiS Cells

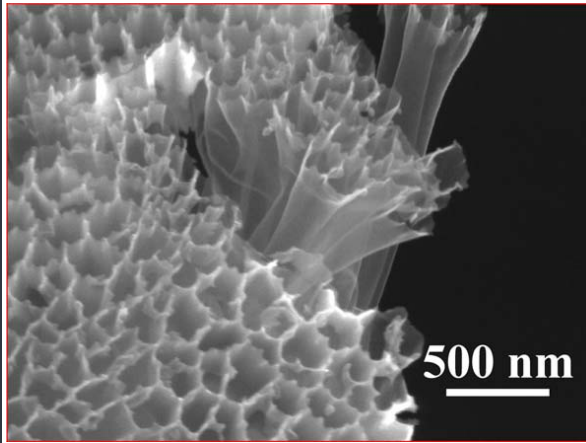
With the sulphur cathode as part of a complete battery, the higher charge capacity makes it possible to build a battery with four to five times the energy storage compared to existing lithium ion battery technology.

Lithium-sulphur batteries have received attention because of the low cost and non-toxicity of sulphur. However, previous generations of lithium sulphur cathodes have not been viable for commercialisation because they rapidly fail from repeated charging and recharging.

The new cathode design improves battery capacity because it has a nearly closed structure that prevents polysulfides from significantly leaking out into the electrolyte solution. The length of a hollow nanofiber is about 300 times its diameter; the long and narrow channels prevent polysulfides from contaminating the electrolyte.

In addition to the energy storage gains made with improved sulphur hollow carbon nanofiber fabrication, Cui's graduate student Yuan Yang included an electrolyte additive that enhances the battery's charge and energy efficiency, known as the coulombic efficiency.

"Without the additive you put 100 electrons into the battery and you get 85 out. With the additive, you get 99 out," Cui said.



Sulphur Nanotube

Stanford researchers have used nanotechnology to invent a better lithium ion battery cathode. This technique allows for an increase in the charge carries in the cell's structure, therefore increasing the overall power density of the battery.

The utilisation of Sulphur Nanotubes is another in the line of new chemical/physics approaches to improve the energy density of Lithium cells.

The research group of battery inventor Yi Cui, an associate professor of materials science and engineering, uses nanotechnology to fabricate electrode materials that greatly improve the electrical storage capacity of lithium ion batteries. In previous research, they reinvented battery anodes by fabricating them with silicon nanowires. Dr Cui states that; "Sulphur is one of the materials that can offer a 10-times higher charge storage capacity but with about half the voltage of the existing battery."

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<http://www.ata.org.au/branches/geelong-ev-group/>



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Laguna Seca EV Race Day

The 4th Annual REFUEL Clean Power Motorsports Event held earlier this year at Mazda Raceway Laguna Seca California, exceeded all expectations with 29 production cars, dominated by Tesla's, both roadsters and S models, 13 motorcycles, 31 experimental cars and 14 prototype bikes. The event signaled once again the fast-arriving future of electric transportation and competitive electric motorsports. The explosive growth of the production electric car market yielded a larger than ever field of participants in Tesla Roadsters, Nissan Leafs, BMW ActiveEs and CODA 1.0s plus a small fleet of high-performing, factory fresh Model S sedans from Tesla Motors.

KleenSpeed's WX-11 returned to smash their previous year's track record with a 1:32.046 and we were joined for the first time by Ikuo Hanawa in his Pike's Peak-dominating Summit HER-02. The Brammo Empulse TTXGP bike made an appearance as did a large number of stock and prototype bikes from Zero Motorcycles in addition to some home-grown experimental units, conversions and even some electric go-karts.



EV Racing

This issue I decided to take a look at what (if any) electric racing events are being staged around the world, and what vehicles are being used in such events. To my surprise there are quite a number of locations where you can take your non gas guzzler out for an afternoon of fun and frivolity on a top notch racetrack.

The only requirements for running at the event are as follows:- "Cars must have 3-point or better safety restraints and either hard top or roll protection and should have a tow-hook installed. Participants must wear snell-rated 2000 or later helmets. Rental helmets are available. Motorcycle riders must wear full leathers. Cars or motorcycles deemed unsafe for track driving by the organisers will not be allowed on track." No race license, no special training just drive as fast as you dare in your EV. Could be fun!!!

EiG Li Polymer

Energy Innovation Group is a South Korean company that specialises in the manufacture of large format Lithium Ion Polymer cells. Individual cells are provided in 7Ah to 40Ah and Discharge rates from 3C to 30C. Additionally power modules, as pictured, come in 20Ah packs with standard voltages from 24 to 48Volts, complete with integral cooling system and BMS that provides a full cell monitoring and maintenance facility that can provide packs from 24 to 1000Volts at upwards of 800Amps. A single 48Volt 20Ah module weighs in at 6.5Kg, this would mean a 3S10P pack giving 144Volts and 200Ah would weigh 195Kg. Not a bad weight for a pack that has a 2000Amp discharge capacity. Cycle Life can range from 1000 cycles at 100% depth of discharge (that's fully flat) to 5000 cycles at 50% depth of discharge.

EiG



<http://www.eighbattery.com/eng/>

Quimera AEGT



The Quimera Project, the TTXGP motorcycle group, the International Motor Sport Association (IMSA), and the American Le Mans Series (ALMS) have combined their respective areas of expertise in order to start of a new global initiative to develop the next generation of sustainable motor sport. Working together, initial steps will be taken to prepare investors, the general public, media, sponsors and other interested parties for motor sport's impending embrace of clean technology. By 2013 this joint venture will be ready to launch its new international Electric Vehicle (EV) series, the first clean technology professional motor sport championship that will include various categories with the objective of organizing a global, non-fossil fuel based championship.

The prototype Quimera All Electric GT (AEGT) has been homologated as the primary vehicle for the first of the classes in the International EV series.

The Quimera AEGT All-Electric Car produces 700bhp and is the 1st of its class to run on 100% electric batteries and motors and produce similar or superior performance to competition-level internal combustion vehicles. A version of the car is expected to debut in demonstration runs at selected American Le Mans Series race events early next year.

Specifications for the AEGT are:-

Power - 520 kW derived from three UQM motors from the USA

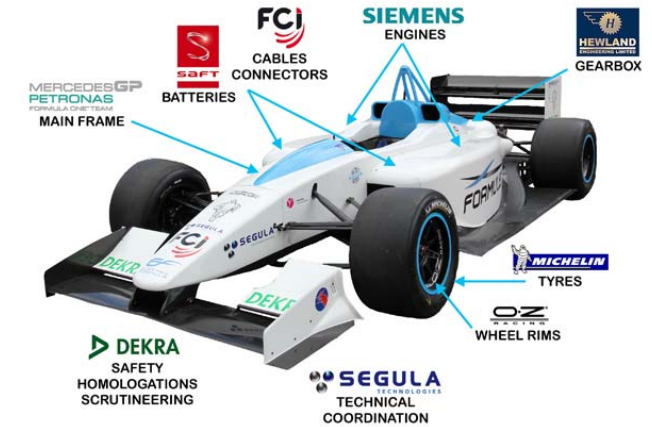
Top Speed - 300kmh
0 - 100kmh - 3sec

Torque - 1000Nm
Batteries - Lithium Polymer EiG cells from South Korea.

Look What EV's Have Done Now!!



Formulec EF01

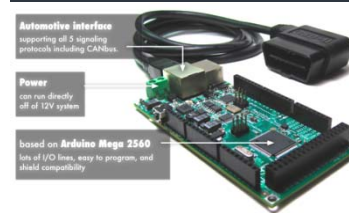


Rio Brazil has been announced as host of the inaugural Formula E race starting in 2014. Formula E is a new FIA championship featuring Formula cars powered exclusively by electric energy. FIA president Jean Todt states - "It represents a vision for the future of the motor industry over the coming decades!"

Demonstrations of the Formula E cars will start in 2013, followed by the first race in 2014. Initially 10 teams and 20 drivers will participate in the competition, with the option of 2 additional teams joining festivities in 2015. The races will be ideally staged in the heart of the world's leading cities, around their main landmarks. Locations have not been finalised yet but USA, Oceania, Europe and Africa.

The open wheel F1 style car displays a serious pedigree with a chassis designed and built by Mercedes Petronas Formula 1 team, the two AC motors from Siemens, batteries from SAFT and a two speed transmission from Hewland Engineering- (Formula 1 gearbox manufacturers). Performance is, as you would expect, no slouch - top speed is 250kmh, 0 to 100kmh is 3 seconds, race autonomy is 20 minutes under full race conditions. Qualifying lap times are in the timeframe of a Formula 3 car. A full charge will take between one and one and a half hours.

This Month's Q&A Technology Tip



Q. I am having difficulty in getting the Air-conditioning working in my conversion car, is it possible to "talk" to the original engine management system to fix this?

A. Recharge are currently working on a system they have dubbed "Macchina" which is an Arduino (hobby microprocessor) designed system that interfaces directly with the OBD2 (1996 on) car engine communication

system. Effectively you can program the Macchina to send the correct signals to the EMS and regain access to the cars more sensitive niceties, like air conditioning.

No pricing yet but keep an eye on - <http://www.rechargecar.com/macchina>