

# Magnetoelectric lithium-ion battery

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LMPE and Fe<sub>3</sub>O<sub>4</sub> were combined to prepare magnetoelectric current sensor MCS. The MCS can achieve real-time monitoring and early warning for ESC. The MCS has potential for electric vehicle battery safety applications.

Here, the use of the solid-state lithium-ion battery technology for reversible voltage-controlled switching between perpendicular and in-plane magnetization states in a Co-Pt bilayer is demonstrated. Due to the small size and high mobility of lithium ions, small voltages produce an exceptionally high magnetoelectric coupling efficiency of at least 7700 fJ V ...

ion migration to control magnetism--has attracted interest because it can generate large magnetoelectric effects at low voltage. Here, the use of the solid-state lithium-ion battery technology for reversible voltage-controlled switching between perpendicular and in-plane magnetization states in a Co- Pt bilayer is demonstrated ...

Here, we demonstrate reversible voltage-controlled magnetic switching in a thin Co/Pt electrode layer using a solid-state lithium-ion battery structure. The magnetization of the Co film is switched from perpendicular to in-plane when lithium ions migrate from a LiCoO<sub>2</sub> storage layer into the Co/Pt electrode.

For example, lithium control of magnetism in moleculebased magnet has been integrated with rechargeable lithium-ion batteries for real-time state-of-charge estimation <sup>7</sup>. However, alkali metal ions ...

By combining solid-state Li ion battery technology with an out-of-plane magnetized Co/Pt-based stack coupled through a Ru interlayer, we investigate the effects of ...

Magnetic/Force Coupling assisted Li-O<sub>2</sub> battery relies on magnetostriction and piezoelectric catalysis principle to generated electrons and holes promote oxygen reduction and evolution to improve battery performance, at the same time, the magnetohydrodynamic effects inhibited the growth of lithium anode dendrites It provides a new strategy ...

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A high-performance silicon-carbon nanocomposite facilely prepared by one-step magnetoelectric plasma pyrolysis of the mixture of methane, silane, and hydrogen is proposed for lithium-ion batteries. The ratio of silane, methane, and hydrogen was studied to optimize the properties of the composite. When the ratio of hydrogen/silane/methane is 1:1:3, the composite is composed of ...

Lithium-Ion Battery Cycling for Magnetism Control Qingyun Zhang,+ Xi Luo,+ Luning Wang,? Lifang Zhang,? Bilal Khalid,+ Jiangong Gong,+ and Hui Wu\*,+ +State Key Laboratory of New Ceramics and Fine Processing, School of Materials Science and Engineering, Tsinghua University, Beijing, 100084, China ?School of Materials Science and Engineering, ...

La batterie lithium-ion a une haute densité d'énergie, c'est à dire qu'elle peut stocker 3 à 4 fois plus d'énergie par unité de masse que les autres technologies de batteries. Elle se recharge très vite et supporte de nombreux cycles (au moins 500 charges-décharges; 100 %). En revanche, elle présente un risque d'embrasement soudain de la batterie, avec ...

The PVDF-TrFE/Metglass magnetoelectric sensor can monitor the fluctuation of the lithium-ion battery current, enabling real-time detection and early warning of external short circuits and vibration impacts, presenting great value in lithium-ion battery safety monitoring.

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