Germanium-doped lithium battery

Can germanium be used for high-capacity lithium ion batteries?
Authors to whom correspondence should be addressed. Germanium,a promisingelectrode material for high-capacity lithium ion batteries (LIBs) anodes,attracted much attention because of its large capacity and remarkably fast charge/discharge kinetics.

Is germanium a good anode material for lithium ion batteries?
Germanium (Ge) is a promising anode materialfor lithium ion batteries due to its high theoretical capacity. However,its poor cycling stability associated with its large volume changes during discharging and charging processes are urgent problems to solve. This provides opportunities to engineer materials to overcome these issues.

Is germanium a negative-electrode material in a lithium-ion battery?
Generally,this corresponds to the phase equilibrium diagrams [2,3]. Germanium was first mentioned as a negative-electrode materialin a traditional low-temperature lithium-ion battery in 2004 and 2008 [4 - 8]. In the quoted papers,the above-given composition of the lithium-germanium intermetallic compounds was largely confirmed.

Are germanium oxides a good raw material for lithium ion batteries?
The germanium oxides as raw material for the manufacturing of negative electrodes of lithium-ion and sodium-ion batteries are likely to take leading positionsbecause they simplify technology of the electrodes' production and reduce their price significantly.

How much germanium does a lithium ion battery produce a year?
The annual world output of germanium does not exceed 130 t. In spite of the basic limitations, studies of the germanium applying in lithium-ion and sodium-ion batteries are continued on a large scale, which is confirmed, in particular, by the recent publishing of review-articles [25, 26, 37 - 47].

Are germanium nanoparticles a high-performance anode for lithium-ion batteries?
Liu, X., Lin, N., Cai, W., Zhao, Y., Zhou, J., Liang, J., Zhu, Y., and Qian, Y., Mesoporous germanium nanoparticles synthesized in molten zinc chloride at low temperature as a high-performance anode for lithium-ion batteries, Dalton Trans., 2018, vol. 47, p. 7402.

An insight into lithium-ion transport in germanium-doped lithium titanate anode through NMR spectroscopy and post-carbonization for anode applications in lithium-ion battery ...

3.3.3 Li-O 2 Battery. In addition to solid-state lithium-ion batteries, LAGP SE is also applied in lithium-sulfur or lithium-oxygen batteries. [46, 75, 85] Sun et al. prepared LAGP-NCNT-Li 3 InCl 6 air electrode (NCNT stands for nitrogen ...

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Lithium-ion battery based on a new electrochemical system with a positive electrode based on composite of doped lithium iron phosphate with carbon ...

Lithium-ion batteries (LIBs) with superior energy density, rate capability, and cyclability are critically needed for next-generation portable electronics and electric vehicles. ...

The simple fabrication of composites of germanium nanoparticles dispersed on nitrogen-doped carbon nanospheres (Ge/NC) of varying nitrogen content and their ...

Lithium-ion batteries (LIBs) with superior energy density, rate capability, and cyclability are critically needed for next-generation portable ...

The lithium-ion motion inside lithium titanate and germanium-doped lithium titanate was investigated through pulsed-field gradient nuclear magnetic resonance spectroscopy and ...

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Lithium-alloyable materials such as Ge and P have attracted considerable attention as promising anode materials for lithium-ion batteries (LIBs) owing to their high theoretical capacity. ...

Germanium has been shown to be effective as a dopant in stabilising the cubic phase and providing an enhancement in conductivity in garnet LLZO electrolytes. About 0.10 ...

This process with the solid-liquid-solid mechanism can also be extended to produce other group IV elements-based nanowires such as germanium. In addition, the prepared Sn-doped SiNWs ...

A high-temperature battery with molten chloride electrolyte (LiCl-KCl) was studied; it was found that the lithium cathodic insertion to germanium at temperatures from 360 ...

Germanium-based materials, such as Zn 2 GeO 4, ... Alternative lithium-ion battery using biomass-derived carbons as environmentally sustainable anode. J. Colloid Interface Sci., 573 ...

Lithium-alloyable materials such as Ge and P have attracted considerable attention as promising anode materials for lithium-ion batteries (LIBs) owing to their high theoretical capacity. However, these materials inevitably undergo ...

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Germanium is a promising anode material for lithium ion batteries due to its high specific capacity, but still suffers from poor cyclability. Here, we report a facile preparation of a germanium- ...

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