

Here we report the rational design of a high-capacity Li-ion anode material comprising Ge nanowires with Si branches. The unique structure provides an electrode material with tunable ...

482 Part C Materials for Electronics performance. In Si_{1-x}Ge_x heterojunction bipolar transistors (HBTs), the Si_{1-x}Ge_x layer is incorporated into the base and the lower band gap of Si_{1-x}Ge_x than Si is used to advantage to dramatically improve the high-frequency performance. Si_{1-x}Ge_x HBTs have been produced with values of cut-off frequency, f_T , approaching 300 GHz [22.8], a ...

DOI: 10.1016/J.APPLTHERMALENG.2015.05.037 Corpus ID: 106705416; Aluminum and silicon based phase change materials for high capacity thermal energy storage @article{Wang2015AluminumAS, title={Aluminum and silicon based phase change materials for high capacity thermal energy storage}, author={Zhengyun Wang and Hui Wang and Xiaobo Li ...

Germanium (Ge) and silicon are both semiconductor materials, but the forbidden bandwidth of germanium is 0.66 eV less than 1.1 eV of silicon, so that the conductivity of germanium is four orders ...

This chapter reviews the properties of silicon-germanium, beginning with the electronic properties and then progressing to the optical properties. The growth of silicon-germanium is considered, with particular ...

Silicon (Si)-based materials have become one of the most promising anode materials for lithium-ion batteries due to their high energy density, but in practice, lithium ions embedded in Si ...

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To make germanium--or any alternative channel material--work in mass manufacturing, we must find a way to incorporate the material on the dinner-plate-size silicon wafers that are used to make ...

Silicon and Germanium oxide (SiO_x and GeO_x) nanostructures are promising materials for energy storage applications due to their potentially high energy density, large lithiation capacity (~10X carbon), low toxicity, low ...

This review is focused on the topical developments in the synthesis of nanocomposites using the simplest top-down approach, mechanochemical milling, and the related aspects of the interfacial interactions. Milling

constraints include time duration of milling, ball size, the ball-to-sample content proportion, rotation speed, and energy that took part in a vital part ...

DOI: 10.1002/anie.201602653 Corpus ID: 35473741; Electrolytic Formation of Crystalline Silicon/Germanium Alloy Nanotubes and Hollow Particles with Enhanced Lithium-Storage Properties.

Adsorption and diffusion of lithium and sodium on the silicon nanowire with substrate for energy storage application: A first principles study. Materials Chemistry and Physics 2020, 253, ...

Moreover, germanium has lower average energy necessary to create an electron-hole pair, which is 3.6 eV for silicon and 2.9 eV for germanium. This also provides the latter a better resolution in energy. A large, clean and almost perfect germanium ...

The materials germanium and silicon are often used in semiconductor devices. Germanium has higher electrical conductivity than silicon. Silicon is more suitable for high-power devices than germanium. A relatively new material with the desirable features of both germanium and silicon is gallium arsenide.

As global energy priorities shift toward sustainable alternatives, the need for innovative energy storage solutions becomes increasingly crucial. In this landscape, solid-state batteries (SSBs) emerge as a leading contender, offering a significant upgrade over conventional lithium-ion batteries in terms of energy density, safety, and lifespan. This review provides a thorough ...

Two-dimensional siloxene sheets are an emerging class of materials with an eclectic range of potential applications including electrochemical energy conversion and storage sectors.

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