Lithium vs ion battery difference

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When it comes to batteries, one of the most common and widely used types is lithium-ion (Li-ion). However, many people may confuse these with (or be unaware of) another battery type, known as lithium batteries.

Here, we explore the key differences found between a lithium vs Li-ion battery to provide a better understanding of their chemistry, applications, advantages, disadvantages, safety considerations, and environmental impact.

Lithium batteries: Lithium batteries typically refer to non-rechargeable, primary batteries. These batteries use lithium metal as one of their primary components. The lithium metal reacts with other materials within the battery to produce electrical energy. Lithium batteries can typically be found in wrist watches, TV remotes and children"s toys.

Lithium-ion batteries: In contrast, lithium-ion batteries are rechargeable, secondary batteries. They do not use pure lithium metal. Instead, they rely on lithium compounds like lithium cobalt oxide, lithium iron phosphate, or other variations. These compounds allow for the reversible movement of lithium ions between the positive and negative electrodes, creating the charge and discharge cycle.

Lithium batteries: Lithium batteries function on a one-way process. They generate electrical energy through the chemical reaction between lithium and other materials. Once depleted, they cannot be recharged.

Lithium-ion batteries: Lithium-ion batteries operate through a reversible electrochemical process. When you charge a Li-ion battery, lithium ions move from the positive electrode to the negative electrode. During discharge, the ions move back, producing electrical energy. This cycle can be repeated multiple times.

Lithium batteries: Lithium batteries often have a higher energy density than their lithium-ion counterparts. This means they can store more energy for their size and weight.

Lithium-ion batteries: While lithium-ion batteries have a lower energy density compared to lithium batteries, they excel in terms of rechargeability, making them suitable for a wide range of applications.

Lithium batteries: Lithium batteries are typically designed for single-use applications and do not support rechargeability. Once their energy is depleted, they must be disposed of properly.

Lithium-ion batteries: Lithium-ion batteries are designed to be recharged and can endure hundreds to thousands of charge and discharge cycles, depending on their chemistry and quality. Again, this makes them a cost-effective and sustainable option for many applications.

Lithium-ion batteries have a broader range of applications due to their rechargeable nature and diverse chemistries. They"re commonly used in portable electronic devices such as smartphones, laptops, and tablets, as well as e-vehicles. In contrast, lithium batteries are typically used in applications with lower energy demands, such as hearing aids or traditional wrist watches.

The environmental impact of batteries should not be overlooked when it comes to disposing of them responsibly. Battery recycling (lithium-ion especially) allows for the recovery of valuable materials and minimises environmental impact. Both types of battery can be taken to recycling centres (although you may need specific centres for lithium-ion batteries), and you could also check retailer take-back schemes and battery collection events.

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