

Numerous types of zinc-based batteries like nickel-zinc/aqueous zinc batteries, alkaline manganese dioxide/zinc batteries, silver-zinc batteries, zinc-air batteries, and zinc-ion batteries are now being used for various applications (Biton et al. 2017; Li et al. 2019).



But silver-zinc batteries continue to have potential advantages, even over lithium-ion batteries, that make them attractive for commercial markets, especially when the batteries need to be tiny. For one thing, lithium-ion batteries are prone to a phenomenon known as thermal runaway, which in rare but disastrous cases causes them to



Additionally, aqueous rechargeable zinc batteries are promoted as a sustainable and cost-effective alternative to lithium-ion batteries, especially for renewable energy storage.

## SILVER ZINC VS LITHIUM ION **BATTERY**





That means megawatt-scale batteries must have pricey cooling and fire-suppression technology. "We need an alternative to lithium," says Debra Rolison, who heads advanced electrochemical materials research at the Naval Research Laboratory (NRL). Enter zinc, a silvery, nontoxic, cheap, abundant

Experimental new silver???zinc technology (different to silver-oxide) may provide up to 40% more run time than lithium-ion batteries and also features a water-based chemistry that is free from the thermal runaway and flammability problems that



The current dominance of high-energy-density lithium-ion batteries (LIBs) in the commercial rechargeable battery market is hindering their further development because of concerns over limited lithium resources, high costs, and the instability of organic

## SILVER ZINC VS LITHIUM ION BATTERY





As zinc silver batteries are free from flammability problems that plagued the Li-ion batteries because of the usage of water-based electrolyte, they are regaining interests as concerns over safety and environmental impact increase such as printed batteries for 9,10



Zinc-ion batteries use zinc ions instead of lithium ions to store and release energy. They are considered a promising alternative to lithium-ion batteries because zinc is abundant, low-cost, and environmentally friendly. Zinc-ion batteries are also more stable than lithium-ion batteries and have a longer lifespan.