

## Rechargeable nickel metal hydride batteries

A nickel-metal hydride battery (NiMH or Ni-MH) is a type of rechargeable battery. The chemical reaction at the positive electrode is similar to that of the nickel-cadmium cell (NiCd), with both using nickel oxide hydroxide (NiOOH). However, the negative electrodes use a hydrogen-absorbing alloy instead of cadmium. NiMH batteries can have two to three times the capacity of NiCd batteries of the same size, with significantly higher energy density, although only about half that of lithium-ion batteries.

They are typically used as a substitute for similarly shaped non-rechargeable alkaline batteries, as they feature a slightly lower but generally compatible cell voltage and are less prone to leaking.

In 1998, Stanford Ovshinsky at Ovonic Battery Co., which had been working on MH-NiOOH batteries since mid-1980, improved the Ti-Ni alloy structure and composition and patented its innovations.

About 22% of portable rechargeable batteries sold in Japan in 2010 were NiMH. In Switzerland in 2009, the equivalent statistic was approximately 60%. This percentage has fallen over time due to the increase in manufacture of lithium-ion batteries: in 2000, almost half of all portable rechargeable batteries sold in Japan were NiMH.

In 2015 BASF produced a modified microstructure that helped make NiMH batteries more durable, in turn allowing changes to the cell design that saved considerable weight, allowing the specific energy to reach 140 watt-hours per kilogram.



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