Using Li-Ion Rechargeable batteries in Hi-Tech Devices

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Modern Hi-Tech devices such as cell phones, medical apparatus, electrically driven automobiles, and portable computers take advantage of rechargeable Li-Ion batteries. This battery technology offers the most power stored per volume, low weight, and low self-discharge. Li-Ion batteries can also be charged and discharged many times over the life of the battery.

Li-Ion batteries should never be exposed to temperatures above 120° F and optimally used between 32-104° F temperatures.

When operated in the optimum region of 10% charge to 90% charge, Li-Ion batteries provide a nearly steady output voltage under use. While being charged, they convert most of the applied charging power directly to stored chemical energy. Due to the very low self-discharge of this battery technology, the stored charge is retained for very long periods of time. Many Li-Ion batteries will lose only 10% of stored energy in a 6-month period.

The Li-Ion battery technology does not experience any “memory effect” that is found in other types of rechargeable batteries. Without any “memory effect”, there is no reason to wait until the battery is nearly depleted before recharging. In fact, the exact opposite is true, as the battery should be charged whenever possible to keep the depth of discharge to a minimum. Allowing the Li-Ion battery to discharge fully will result in the battery’s tendency to swell and lose capacity.

When the battery is in the optimum charge region, the charging circuitry will recharge the battery to 100% capacity in the designed time. If the battery is above 90% charge, the charge circuitry will not further charge the battery. It should indicate the battery is fully charged, and monitor the charge state to re-activate the charge cycle, if needed.

When the battery is below 10% capacity, the charge protocol should indicate a low battery condition. In low battery condition, a “trickle-charge” minimizes damage to the battery-- the reduction of capacity and battery swelling. This “trickle-charge” may take hours to bring the battery into the optimum zone, after which normal charging will take place.

In Summary: Due to the properties of Li-Ion batteries and their charging circuitry, it is best to always recharge when convenient and not wait for the low-battery indication. If the device shows a low-battery condition, charging the battery may take much longer due to the “trickle-charge” protective circuitry. The charge circuitry will not overcharge the battery. Recharge these batteries at least every 6 months even if the device is not used. Store and use the device in temperatures that will normally not exceed 104° F and never in temperatures above 120° F.