
Technology Fact Sheet - 1610

Technology Description

In Lead-Acid batteries, there exist an anode of lead (Pb) and a cathode of lead dioxide (PbO₂). The PbO₂ is present in the form of a paste on a collector grid. As the battery cycles, the PbO₂ transforms into PbSO₄ and dissolves into the electrolyte. As this occurs, the volume of the PbO₂ paste decreases and as the cycle is reversed, the paste returns to its original volume. Over many cycles, stress is induced into the paste that eventually causes cracks and material shedding, leading to battery failure. This technology deals with a reformulation of the battery paste to reduce the stresses in the paste during the battery cycle.

Statement of Problem Solved

This invention entails the application of organic binders to impart mechanical integrity to the paste component in electrochemical power storage devices (lead acid batteries). The binders promote cohesion between the particles in battery paste after it is dried upon a current collector grid, which may be comprised of traditional (e.g. lead) and alternative electrode materials (e.g., graphite fiber weaves and graphite foam). The increase in cohesive strength imparted by the binders prevents drying crack formation, cohesive failure, and shedding of the battery paste during electrochemical cycling.

Product Differentiation and Benefits

The overall effect of this invention is an increase in battery life.

Inventors

Glen H Kirby - Primary

Beth L Armstrong