063

Preliminary Study of energy storage of concrete battery based on iron anode-zinc cathode

In the world's efforts to reduce carbon emissions and introduce zero-carbon buildings, concrete as the most used building material can be used to store a building's power. This research explores how concrete can be used as a rechargeable battery to store power from renewable energy sources such as solar energy and power a building. Some work has been attempted to convert concrete into energy-storing batteries. Previously, researchers tried to make non-rechargeable batteries out of concrete. The concept has been using one part as an electrode and another as a cathode with a separator in between thus making a whole battery. The anode components that have been used include either zinc, magnesium, or iron while the cathode component include either manganese oxides, copper, or nickel. In this research, we chose iron as the anode and zinc as the cathode and electroplated the metals into a carbon fiber mesh. The separator was made of a cement mortar paste mixed with carbon fibers and ionic exchange resin to increase conductivity. The battery was charged and tested and found to light a small led lamp. The battery is expected to perform better and light the LED lamp without charging hence proving it can store energy and hence be recharged. Also, it is expected to test the mechanical properties of concrete in the batteries before and after charging.

Funding support: US HUD H-21735CA