

MADISON JANES, MATTHIAS BAUR, and MAHMOOD HOSSAIN, Dept of Computer Science and Mathematics, Fairmont State University, Fairmont, WV, 26554, and ERICA HARVEY, Dept of Natural Sciences, Fairmont State University, Fairmont, WV, 26554. Data mining of solar panel data to analyze the effects of different metals in producing photocurrent.

Solar panels are photosensitive devices that generate electric current by being exposed to radiant power. The “Solar Army” research group at FSU’s Department of Chemistry has been collecting solar panel data. These data consist of readings from plates that contain oxides of various metallic elements. Each of these plates is represented by a 6x6 grid of cells, where the leftmost and rightmost cells are known as standards -- typically containing copper and iron respectively. The original data has been preprocessed to represent the data for one of the 6x6 cells of a plate with one data record, including the type of electric lead used, the amount of photocurrent, and the amount of fifteen different metals present on the cell. The goal of this work was to analyze the effects different metals in generating photo current so that the effectiveness of the solar panels can be improved. We used the data mining tool Weka to preprocess and apply class association rules (CAR) mining to discover the combination metals that can produce different intensities of photo current. We also applied quantitative association rule mining to determine if the quantity of metals present can affect the photo current. These test results may be important not only to the Solar Army research group, but also to manufactures and scientists attempting to increase the effectiveness of solar panels.