# Modeling of the potential and current density distribution on the electrodes of a lithium-polymer battery

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There is a significant interest in the use of batteries for hybrid electric vehicle (HEV) and electric vehicle (EV). The outstanding characteristics of lithium-polymer batteries (high energy density, high voltage, low self-discharge rate, and good stability among others) make them the preferred choice for such applications. However, much larger lithium-polymer batteries than those available in the market for consumer electronics are required for HEV and EV applications. If an electrode is not designed optimally, the potential and current density will be non-uniformly distributed, and the utilization of the active material over the electrode will be non-uniform. Therefore, an optimum design of the electrode is pertinent for the production of larger lithium-polymer batteries. In this work, a modeling study is performed to calculate the potential and current density distribution on the electrodes for the scale-up of the electrode of a lithium-polymer battery. The effects of the aspect ratio, the placing of current collecting tabs, and the total amount of the current flowing through an electrode on the battery performance will be discussed.