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Metal oxide-based anode materials for lithium-ion battery

Raphael M. Obodo, Chinwe C. Nwanya, Tabassum Hassina, Mesfin A. Kebede, Ishaq Ahmad, Maaza Malik, and Fabian I. Ezema

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Abstract

One of the main and crucial components of a lithium-ion battery (LIB) is the anode, a negative electrode as equally significant as the cathode positive electrode. Anodes are typically characterized by delivering a high capacity with low operating potential, unlike cathodes that normally give a low capacity with high working potential. In order to design and develop ideal anode materials, there are important factors which should be taken into consideration, such as material that has a high specific surface, can offer more lithium insertion channels, low volume change during a Li-ion insertion/desertion process in order to get good cycling stability, high electronic and ionic conductivity, which leads to fast charging and discharging, low intercalation potential for Li to get high overall voltage for the full cell, low price, and being environmentally benign.