

The electrochemical cell Chapter 1

The most fundamental unit of a battery is the electrochemical cell. All performance characteristics are dependent on the materials inside the cell, and all cells work according to some general principles independent of the materials employed. The purpose of this chapter is to bring together the fundamental aspects of an electrochemical cell as the basis for all further steps in the development of a battery intended for electric vehicles.

An electrochemical cell converts chemical energy to electric energy when discharged, and vice versa. In addition, the electrochemical cells can be said to be either electrolytic or galvanic. In an electrolytic cell, the electric energy is converted to chemical energy (charging of the battery) and in a galvanic cell chemical energy is converted to electric energy (discharging of the battery).

The oxidation reaction takes place at the negative electrode, the anode, and electrons are transferred, via the external circuit, to the positive electrode, the cathode, where the reduction reaction takes place by accepting the electrons.

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