

Numerical Modeling in Electrochemistry by Voronoi Finite Volume Methods

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Electrochemical devices like fuel cells and batteries are characterized by strongly coupled complex physical processes. Mathematical modeling and numerical simulation of such devices, and also of supporting experiments like flow cells, are valuable tools to gain better insight into various aspects of their functioning.

Due to its capability to preserve important physical properties of the continuous problem, Voronoi box based finite volume methods are our method of choice when it comes to the space discretization of such problems. We discuss advantages and challenges of this method and present results of numerical simulations of electrochemical devices.