

Electrochemistry of Blue Energy Devices and Acid-Base Machines

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On the basis of ionic concentration gradient, novel electrochemical systems can be a viable alternative to harvest energy. CAPMIX, mixture entropy batteries, acid-base machines, and photo-assisted acid-base machines are achievable means of harvesting energy that is commonly wasted [1-4]. These blue energy devices use sources like river water and seawater. The ionic concentration gradient in these sources permits entropic energy to be converted to electrical energy with low environmental impact. We have developed electrochemical devices based on neutralization reactions, which can also feed the energy storage grid as well to contribute to sustainable growth: environmental preservation through treatment of wastewaters could be profitable for industrial sector that generate significant amounts of acidic and/or basic wastes.

To gain better comprehension of ion insertion in host matrices and to enable coupling of mass transport and reaction mechanism, we have obtained transfer functions from novel model in the frequency domain. The maximum work, practical work, dissipated energy, potential rise, and efficiency of these electrochemical systems can be estimated for each of the steps involved in the blue energy devices and acid-base machines for different combinations of ionic concentration in solution.

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Referências:

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