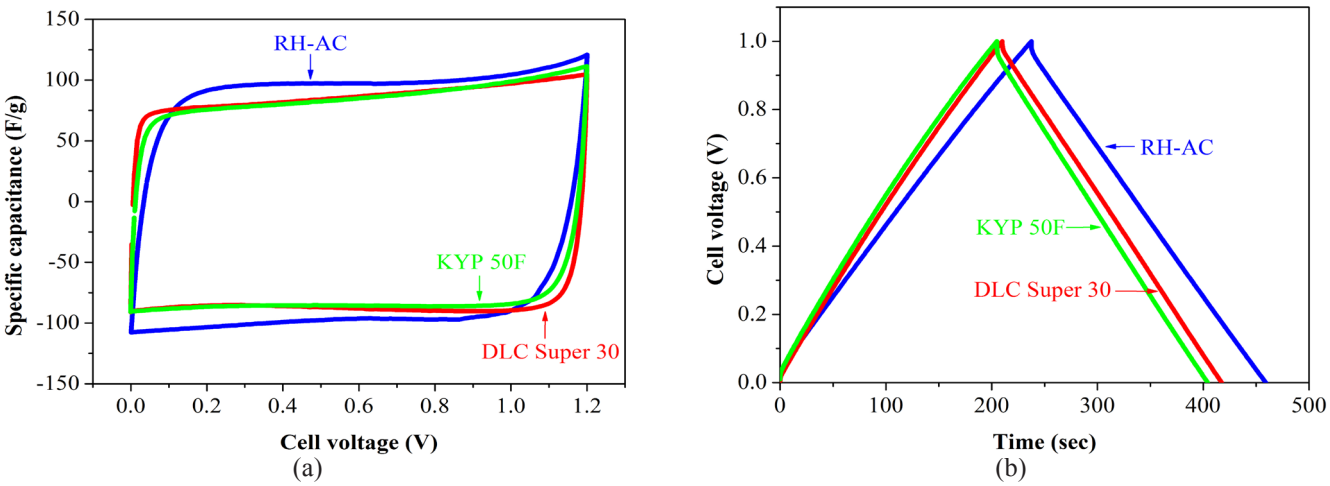

Fig. 4. (a) CV of 2E cells assembled in 100 mmol L^{-1} NaCl at 5 mV s^{-1}, (b) GCPL cuves at 200 mA g^{-1}.

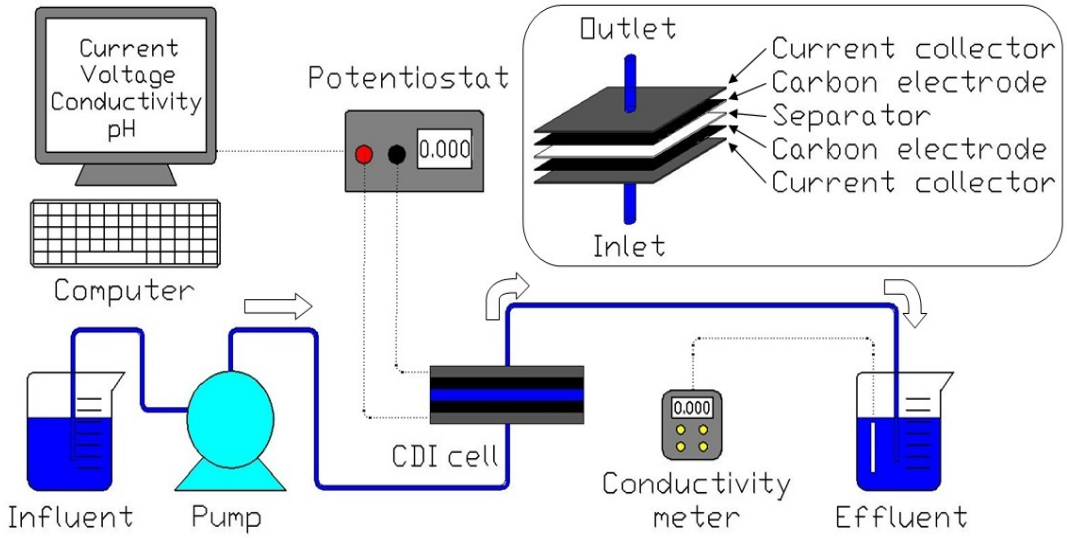

Fig. 5. Principle scheme used for capacitive deionization of brackish water solutions.

The kinetics of the desalination during the CDI process with different electrodes has been exemplified in Fig. 6b. Herein, one can see that the electrosorption capacities were raising along with the increase of time before they reached the aforementioned values. In turn, the Ragone plots illustrated in Fig. 6c were employed to measure the rate and electrosorption capacity of the as-prepared electrodes. It is noted that the curve corresponding to the electrodes based on RH-AC is located in the upper and righter region of Ragone plots, which means that they possess the largest electrosorption capacity and fastest electrosorption rate. In other words, since the RH-AC possesses higher values of specific surface area and specific capacitance than of KYP 50F and DLC Super 30, thereby the former provides more area to store ions in terms of formation of an electrical double layer.

In order to further explore the CDI performance of as-prepared electrodes, the CDI electrosorption experiments at different initial concentrations were realized. RH-AC electrode possesses an improved electrosorption capacity at all initial concentrations compared to KYP 50F and DLC Super 30 electrode composites (Fig. 6d). As can be seen from Fig. 6d, the salt retention capacity increases from 8.74 to 20.05 mg g^{-1} for RH-AC and from 6.97 to 15.84 mg g^{-1} for KYP 50F with increasing NaCl concentration from 5 to 100 mmol L^{-1}.

From the electrosorption experiments it has been revealed that among three different type of electrodes, the one which is based on RH-AC can adsorb the largest amount of ions from the aqueous solutions of NaCl. According to Eq. (2), the electrosorption capacities of electrodes based on RH-AC, KYP 50F and DLC Super 30 electrodes were equal to 8.74, 6.97 and 7.59 mg g^{-1}, respectively.