Comparative studies of ultra-high dilutions of LiCl: impedance spectroscopy in the frequency range of 1kHz to 13MHz

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The impedance spectroscopy technique was applied to the physical characterization of ultra high dilutions of lithium chloride, in the range 1kHz to 13MHz. This characterization was obtained, mainly, by investigating the behavior of the imaginary part of the impedance of diluted and dinamized solutions, for concentrations down to 10^{-30} mol/l (referred to initial LiCl solution). The experimental results were compared to the ones obtained for water, which have been submitted to exactly the same process of dilution and dinamization.

Preliminary tests were carried out in order to identify the best experimental conditions to be used, mainly in respect to choosing the samples' temperature. In result, the best measuring protocol was observed to be the one in which the liquid samples were measured at room temperature, maintained practically constant by an air conditioning system.

The experimental data related to the real and imaginary part of the impedance, for each

frequency value, were modeled by adjusting the parameters of an equivalent electric circuit. The results of this analysis showed that the impedance values of the ultra high dilutions and of the water agree quite well with the modeling, when the circuit are composed by a resistance r in series with a RC circuit (in parallel).

For both the ultra high dilutions (concentration smaller than 10^{-6} mol/l) as well as for the water, a resonant behavior was observed in the experimental curves obtained for the imaginary part of the impedance, characterized by a "peak" between 100KHz and 10MHz.

Clear differences were also observed when the ultra high dilutions of LiCl 15cH (corresponding to 15a. centesimal dilution) were compared to the water. A non-monotonous behavior was obtained when solutions from 3 to 15cH (corresponding to the same lot of samples) were measured.

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