

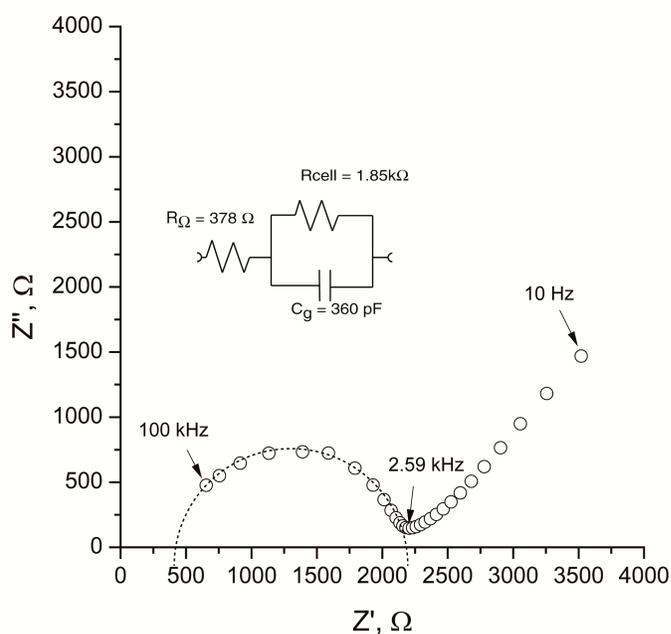
## Limits of Thin Layer Coulometry with Ionophore Based Ion-Selective Membranes

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**Experimental Details.** Impedance spectroscopy was carried on with a PGSTAT 302N (Metrohm Autolab, Utrecht, The Netherlands) controlled by a personal computer with Nova 1.8 software. Three electrode cell consisting of double-junction Ag/AgCl/3M KCl/1 M LiOAc reference electrode (Mettler-Toledo AG, Schwerzenbach, Switzerland) and large surface (0.5 cm<sup>2</sup>) gold electrode was used.

**Impedance measurement.** A typical impedance spectra for the “iodide” inner electrode cell is shown in Fig.1S. The frequency was scanned within 10<sup>-10</sup> Hz. Using the Boukamp model (Fig.1S, the insert) resulted in the solution resistance of 378 Ω and the cell resistance of 1.78 kΩ with the corresponding capacity of 360 pF.



**Figure 1S.** Impedance spectra for the potassium selective Ag/AgI cell containing 0.1 mM KI + NaI. The outer solution is 0.1 mM KCl. The dotted line corresponds to the semi circle fitting, which was obtained with the equivalent circuit shown in the insert.