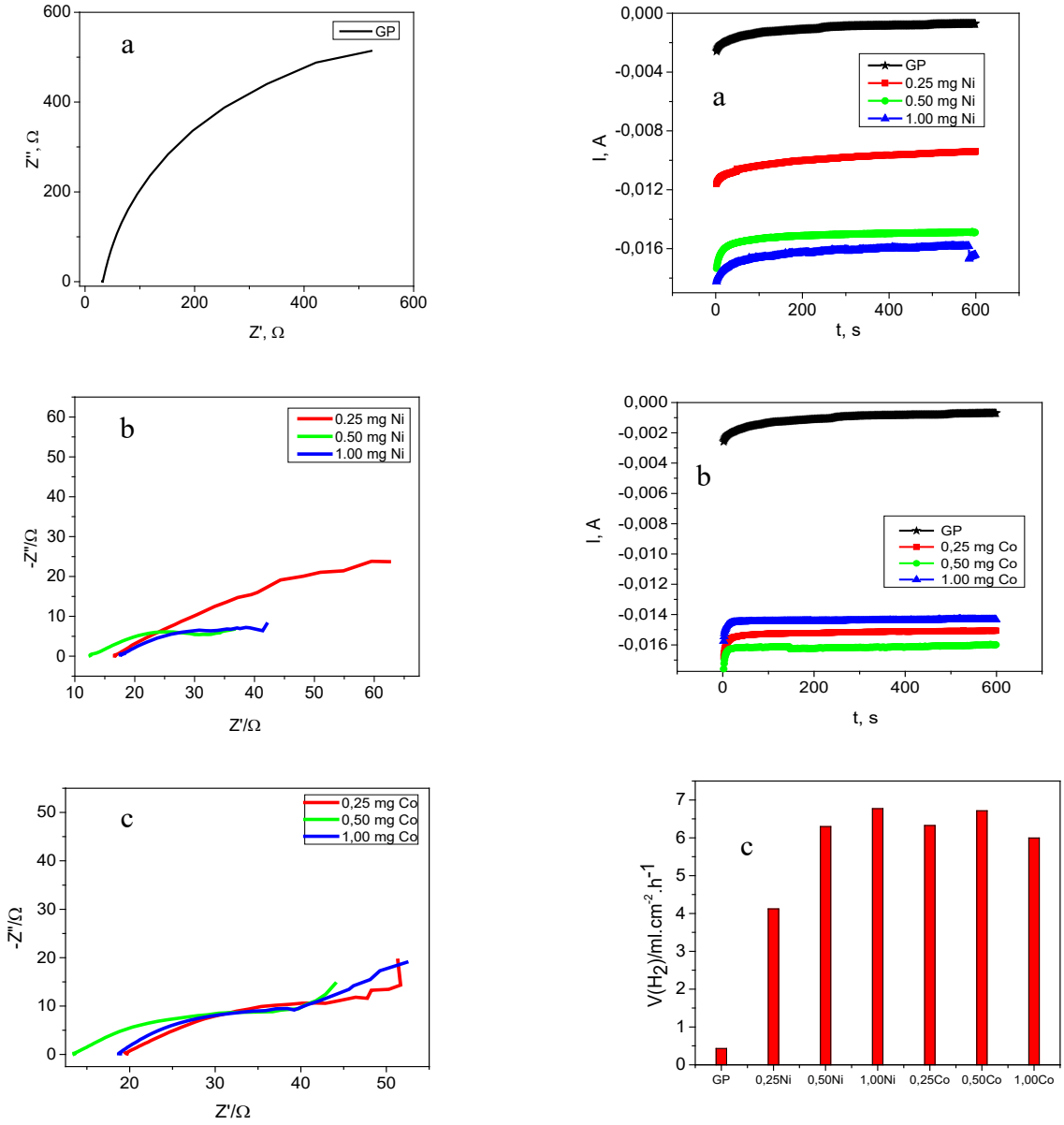

Fig. 3. Nyquist plots of the EIS of the: a) Graphitized paper; b) Nickel catalysts/GP; c) Cobalt catalyst/GP

Fig. 4. Chronoamperometric curves obtained at a potential of -1.2V with investigated materials: a) Ni/GP; b) Co/GP; c) Quantity of the produced hydrogen, calculated by integration of areas under chronoamperometric curves obtained at a potential of -1.2V.

CONCLUSIONS

Nickel and cobalt catalysts were deposited on graphitized paper (GP). The electrocatalytic activity of the newly synthesized materials towards HER was investigated in neutral phosphate buffer solution with respect to their potential application as cathodes in microbial electrolysis cells. Despite different catalyst loadings, the estimated current production rates indicate that the developed Ni- and Co-modified electrodes exhibit much higher electrocatalytic activity compared to the non-modified GP. The obtained electrochemical results determined as optimal the catalytic loading of 0.50 mg.cm^{-2}.

The highest current density of 0.05A.cm^{-2} (at -2.0V *vs*. Ag/AgCl) was achieved with 0.50 mg Ni/GP. The obtained values of the quantities of the produced hydrogen, calculated by integration of areas under the chronoamperometric curves obtained at potential -1.2V (*vs*. Ag/AgCl), for the examined materials are ranged in 6.0 ÷ 6.8 ml.cm^{-2}.h^{-1}, except for 0.25 mg Ni/GP – 4.1 ml.cm^{-2}.h^{-1}. Further evaluation of the produced materials as cathodes in MEC is in progress.

Acknowledgements: *This study was supported by the Bulgarian National Science Fund through contract KP-06-H29/8/2018. The authors kindly acknowledge the financial support to project № BG05M2OP001-1.002-0014 Center of Competence HITMOBIL - Technologies and systems for generation, storage and consumption of clean energy, funded by Operational Programme "Science and Education For Smart Growth" 2014-2020, co-funded by the EU from European Regional Development Fund.*

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