Platinum-Containing Nanoparticles on N-Doped Carbon Supports as an Advanced Electrocatalyst for the Oxygen Reduction Reaction
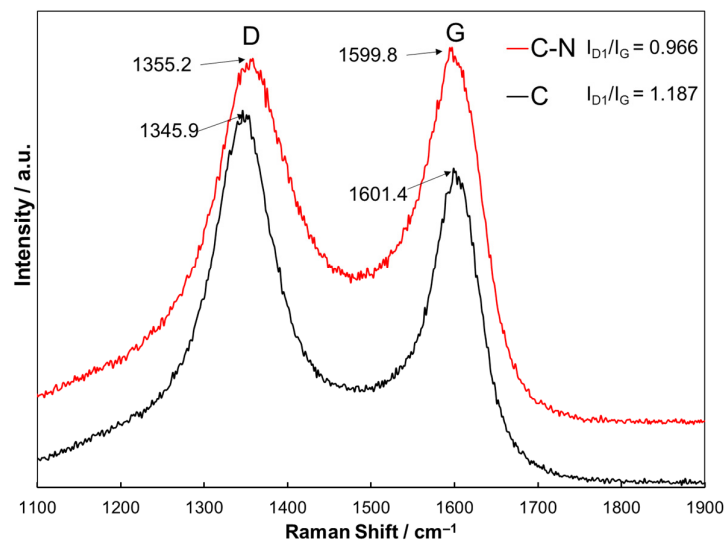
Anastasia Alekseenko [1],*, Angelina Pavlets [1], Elizaveta Moguchikh [1], Mikhail Tolstunov [1], Evgeny Gribov [2], Sergey Belenov [1,3] and Vladimir Guterman [1]

[1] Faculty of Chemistry, Southern Federal University, 7 Zorge St, 344090 Rostov-on-Don, Russia; pavlec@sfedu.ru (A.P.); moguchih@sfedu.ru (E.M.); mtolstunov@sfedu.ru (M.T.); sbelenov@sfedu.ru (S.B.); guter@sfedu.ru (V.G.)
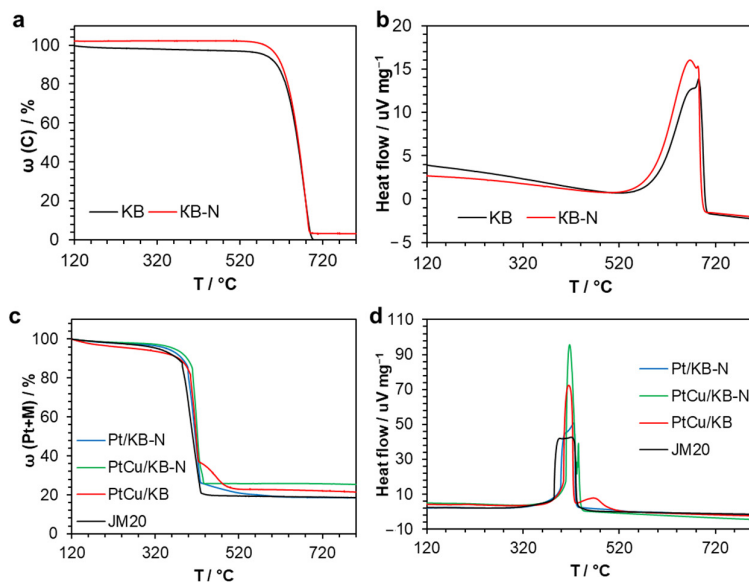
[2] Boreskov Institute of Catalysis SB RAS, 5 Lavrentiev Ave., 630090 Novosibirsk, Russia; gribov@catalysis.ru

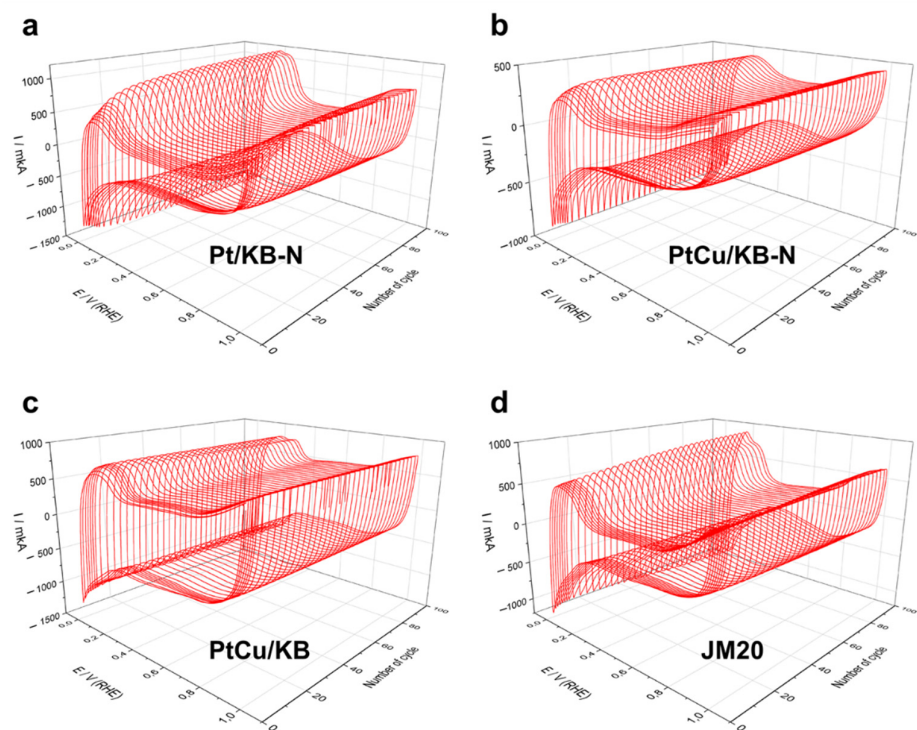[3] Prometheus R&D LLC, 4g/36 Zhmaylova St, 344091 Rostov-on-Don, Russia

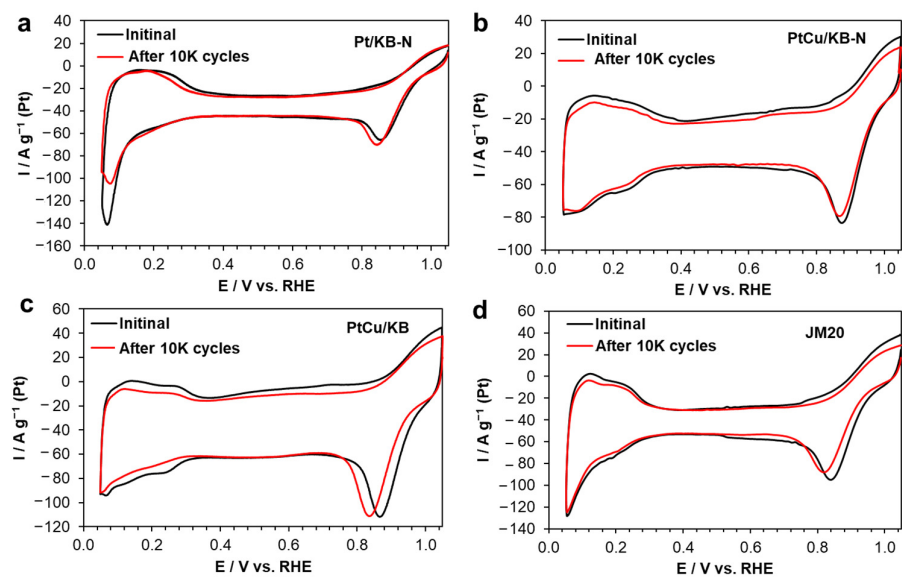* Correspondence: aalekseenko@sfedu.ru

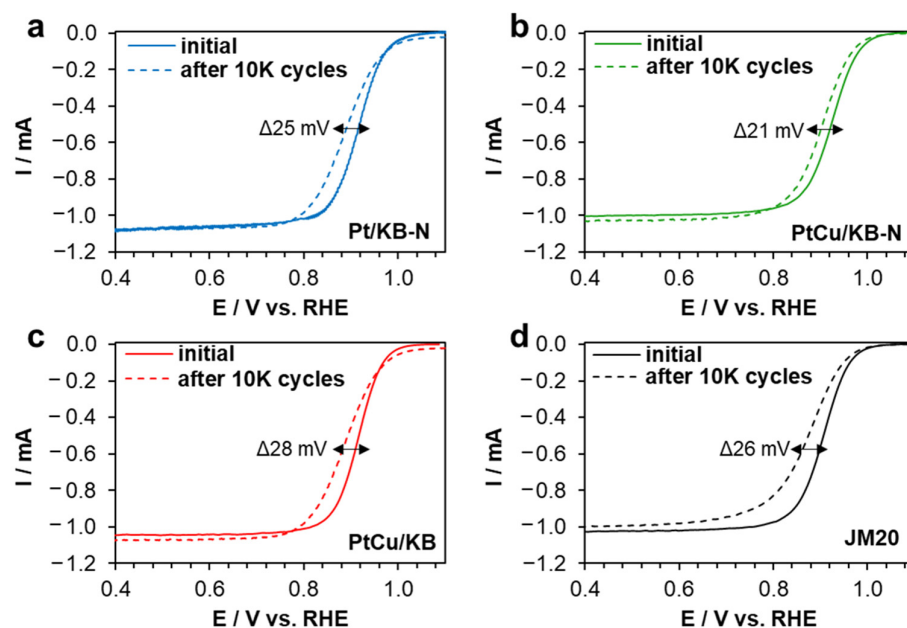**Figure S1.** Raman spectra of undoped and N–doped carbons materials.

Figure S2. (**a**, **c**) TGA and (**b**, **d**) DSC curves of carbon support (**a**, **b**) and catalysts (**c**, **d**) oxidation.
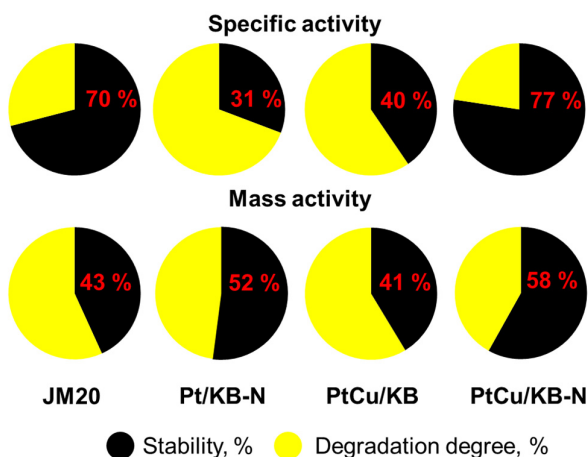
Figure S3. CVs at the stage of catalysts electrochemical activation: Pt/KB-N(**a**), PtCu/KB-N(**b**), PtCu/KB(**c**), JM20(**d**). The sweep rate of the potential is 100 mV s^{-1}.

Figure S4. CVs: initial and after the stress test in oxygen atmosphere: Pt/KB-N(**a**), PtCu/KB-N(**b**), PtCu/KB(**c**), JM20(**d**). Electrolyte is 0.1 M HClO$_4$. Black - initial curves; Red - end curves.

Figure S5. LSV ORR curves before and after the stress test: Pt/KB-N(**a**), PtCu/KB-N(b), PtCu/KB(c), JM20(d). Rotation speed of RDE is 1600 rpm. Electrolyte is 0.1 M HClO₄.

Figure S6. Relative stability and degradation degree of such parameters: mass and specific activity of obtained and commercial samples. The red color indicates the calculated value of corresponding stability for each sample.