TAILOR-MADE ELECTRODE MATERIALS

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The authors of invention propose to use carbon-based hybrid materials (as innovative technology of production) as a cathode material in fuel cells, as well as for the construction of supercapacitors, metal-air batteries or photovoltaic cells. The laboratory tests have proven that the obtained material shows very good electrochemical properties.

Other material advantages include:

- Synthesis conditions: 600-1000 °C
- **Low production cost** (cost below 5 Euro)
- Material stability, there is no significant loss of the raw material, which has a positive impact on the profitability of the production of materials
- **Large specific surface** (surface area up to 1000 m^2/g)
- Controllable porous structure
- Steerable conductivity
- **High activity** as cathode material for oxygen reduction, better than Pt or Pd-based electrode materials
- Number of electrons participating in the ORR reaction is in the range of 2.7-3.8 from the Koutecky-Levich equation

Materials (melamine, graphene nanoplatelets) and the method of its preparation is environmentally friendly, electrochemically efficient and cheap.