

Electrochemical method of obtaining nanosized particles of calcium carbonate from eggshells

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This paper presents a simple electrochemical technique for obtaining nanoparticles of calcium carbonate (CaCO_3) from the of bird's eggshells. Aqueous solutions of acetic (peracetic) acid (0.1-10 % v.) were used as the electrolytic liquid. The titanium anode and cathode were placed outside (anode) and inside (cathode) of the half eggshell (Fig.). Electrolytic liquid outside and inside the eggshell half did not mix during electrolysis (2 hours, 60-85 °C). The eggshell undergoes destruction in an acidic medium with the formation of ultra- and nano- dispersed particles. It was shown by TPD-MS method that solid-phase precipitates obtained by drying from an electrolytic liquid inside and outside the shell contain calcium carbonate (CaCO_3) nanoparticles (Fig.). The sample obtained at the cathode (the inner part of the shell) is distinguished by a smaller particle size. This conclusion was made from the fact that a sharp peak of carbon dioxide CO_2 released when calcium carbonate is heated in a vacuum shifts towards low temperatures [1].

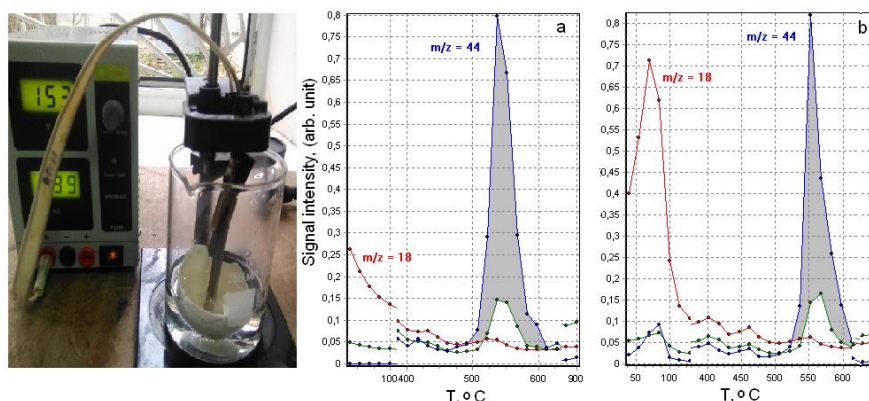


Fig. Electrolysis device (left) and thermogram of electrolytic liquid sediment (1 mg) from the anode space of the electrolytic cell, outer part of the shell (a) and the cathode space, inner part of the shell (b)