FRESHWATER BIOLOGICAL ASSOCIATION

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Title: Badania Nad Otrzymywaniem Wysokozdyspergowanego Stracanego Weglanu Wapniowego.

Experiments on the production of a highly dispersible calcium carbonate. ('Experimental section' only)

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Experiments on the production of a highly dispersible precipitate of calcium carbonate. ('Experimental section' only).

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Experimental Section

Calcium carbonate was produced by a chemical method based on calcium chloride and sodium carbonate (using pure products). The precipitation of calcium carbonate was benefited from a blend consisting of a reaction flask, an electrical agitator and a thermostat. Each time the precipitation was conducted with solutions prepared immediately before commencing the experiment.

The influence of a magnetic field and an ultrasonic field on the size of particles of calcium carbonate was investigated in parallel. To this purpose a constant magnetic field of intensity H = 13 kOe, as well as an ultrasonic field of frequency 800 kHz (generator made at Poznan Politechnic) was used. The method of precipitation of calcium carbonate in a magnetic and ultrasonic field was described earlier [8 - 9]. Preparations obtained by different methods were separated by decantation, and afterwards filtered under reduced pressure on a porcelain Buchner funnel. The sediment was dried at $50 \pm 5°C$, by arranging it in thin layers on glass discs and using the mechanical movement of air.

The dried product was pounded in a porcelain mortar and underwent sieve analysis. In the last process of sieving (sieve 10 thousand mesh cm^2) the product attained a specific dispersion and a precipitate of calcium carbonate so obtained was used for further experiments. Finally the following series of preparations were obtained:

Series I - Calcium carbonate was obtained at 20°C using a 36.5% solution $CaCl_2.6H_2O$ as well as the precipitating agend 25% solution Na_2CO_3, this was sample I-0.

Series II - included preparations obtained as a result of precipitation in an ultrasonic field. A solution, from which calcium carbonate was precipitated, was placed in a 600ml beaker in a thermostatically controlled container and was subjected to ultrasonic waves for 5 minutes. This time the precipitating agent was passed through a tube, the outlet to which was found on the bottom, near the transformer. After precipitation the sonication process was resumed for 30 min. with a synchronous mixture. Three precipitated samples were obtained from solutions with concentrations of calcium chloride and sodium carbonate similar to those in series I, which were indicated by symbols:

II - 1 Temperature of precipitation 20°C, frequency 800 kHz, intensity 60 mA

II - 2 Temperature of precipitation 40°C, frequency 800 kHz, intensity 60 mA

II - 3 Temperature of precipitation 60°C, frequency 800 kHz, intensity 60 mA

Series III - included samples obtained with the participation of an external magnetic field, used for the initial magnetization of solutions. To this purpose, substrates passed at 5cm^3/min. between electromagnetic poles in a constant field H = 13 kOe, at 90° to the line of the field force, precipitation of calcium carbonate followed. Dependent on which substrates underwent magnetization, two biographically different precipitates of calcium carbonate were obtained, according to an earlier written method [9]. Indicated by symbols:

III - 1 A magnetized 36.5% solution of calcium chloride was subsequently treated with 25% solution of non-magnetic sodium carbonate.

III - 2 A magnetized solution of sodium carbonate and a non-magnetic solution of calcium chloride were used for precipitation, concentrations as in III - 1.

Precipitated calcium carbonate was characterised with the aid of a UNICAM - 5P 9200 G spectrophotometer., an X-ray diffractometer TUR-M-61 and an electron microscope JEM-7A. Also shown was its specific area by a method of thermal desorption of argon [10], and also was calculated the specific weight, [NASYPOWY] weight, complete volume of the pores and alkalinity. Using a desiccation method the percentage of water content was established.

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Please note that these translations were produced to assist the scientific staff of the FBA (Freshwater Biological Association) in their research. These translations were done by scientific staff with relevant language skills and not by professional translators.