

Biochemical studies of stable forms of ascorbic acid for use in aquaculture

© Anatoly A. Lapin,^{1*+} Vladimir I. Kodolov,²

Rostislav V. Mustakimov,³ and Andrew A. Kalayda¹

¹ Department "Water Bioresources and Aquaculture". Kazan State Power Engineering University. Krasnoselskaya St., 51. Kazan, 420066. Republic of Tatarstan. Russia.

Phone: +7 (843) 519-42-67. E-mail: lapinanatol@mail.ru

² M.T. Kalashnikov Izhevsk State Technical University. Izhevsk. Republic of Udmurtia. Russia.

³ Scientific and Educational Center of Chemical Physics and Mesoscopy UdSC of Ural Branch of the Russian Academy of Sciences. Izhevsk. Republic of Udmurtia. Russia.

*Supervising author; +Corresponding author

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Abstract

The paper presents experimental data on the production of ascorbic acid preparations using ammonium polyphosphate, stable to oxidation. The resulting product is intended as feed additives for breeding sturgeon fry in order to increase their population in the waters of the Republic of Tatarstan. To obtain ascorbic acid modified with ammonium polyphosphate and food chitosan, a mechanochemical method is used, which consists in the joint grinding of reagents. The process of interaction between ascorbic acid and ammonium polyphosphate takes place at the interface with the formation of nanoparticles containing fragments of the corresponding reagents. The process proceeds with an energy expenditure no more than 220 kJ/mol. The obtained modified ascorbic acid, apparently, is close in structure to L-ascorbyl-phosphate and therefore has an increased stability. Investigations of the process of modification, structure and properties obtained by mechanochemical modification of the interaction products of ascorbic acid and ammonium polyphosphate continue. The study of the interactions of metal/carbon nanocomposites (metal: iron, nickel, copper) modified by ammonium polyphosphate with ascorbic acid and other biologically active substances becomes develops. The prospects of such a direction are determined by the results obtained for the study of the preparations based on ascorbic acid and ammonium polyphosphate. Studies on the natural oxidation of aqueous solutions of the preparation obtained by the described method from ascorbic acid and ammonium polyphosphate showed the best results within 30 days, since the loss of its total antioxidant activity was 35%, and from chitosan 75%. In comparison with this result, the loss for a control sample of ascorbic acid is 79%.

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