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Cavitation technologies in the processes of water purification and disinfection

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Despite the fact that use of cavitation in the processes of purification and disinfection of water is known from the 1989th Mason T., Lorimer Ph., K. Jyoti, A.Pandit, there are certain difficulties in its technological implementation. During our research, we found that simultaneous use of cavitation and bubbling of the gases allows significantly intensify this process and for all gases, we were able to find the synergetic effect of "gas-cavitation" treatment. We also found that a change in the ratio of organic and biological pollutants lead to a change of reaction order from first to second and this fact shows the change of mechanism of cavitational impact. Based on received data we also propose schemes of a transformation of organic and biological impurities in water solutions. One of the main obstacles, that influences the industrial use of cavitation, is a high value of cavitation installations. In order to address this problem, we created an energy-saving method of creation of cavitation, that is based on the phenomenon of resonance and designed fundamentals of construction of low-frequency vibro-resonance devices. We proved that different physical, chemical and biological effects of cavitation are present in our method, but energy consumption of the process is 10 times lower. We also designed and build an experimental model of vibro-resonance low-frequency cavitator.

Biography

Volodymyr Starchevskyy, PhD (1984), Doctor of Technical Science (1997), professor (2001), Head of General Chemistry Department Lviv Polytechnic National University, author of 254 articles, 5 monographs and 26 patents of Ukraine. Field of work includes water and soil treatment, sonochemistry, catalysis and improvement of chemical technology. President of the 13th Meeting of European Society of Sonochemistry (Lviv, 2012).

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