

P-32: Synergism and post-effect of ultrasound cavitation in water dispersions of microorganisms

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During the ultrasound treatment of microorganism's water solutions, in the presents of oxygen, synergetic effect of oxygen activity and cavitation is observed (inactivation rate constant of microorganism is bigger than the summary of individual components rate for 15-30%):

$$k_{US+O_2} > k_{US} + k_{O_2}$$

It is worth to mention, that while using H_2O_2 instead of O_2 as an oxidizing agent additive effect is observed:

$$k_{US+H_2O_2} \approx k_{US} + k_{H_2O_2}$$

Thus, we could claim that in the presence of oxygen the transformation of H radicals into HO_2 radicals takes place. They have oxidative activity, as well the OH radical, while the process goes through radical- mechanism with a low length of the chain.

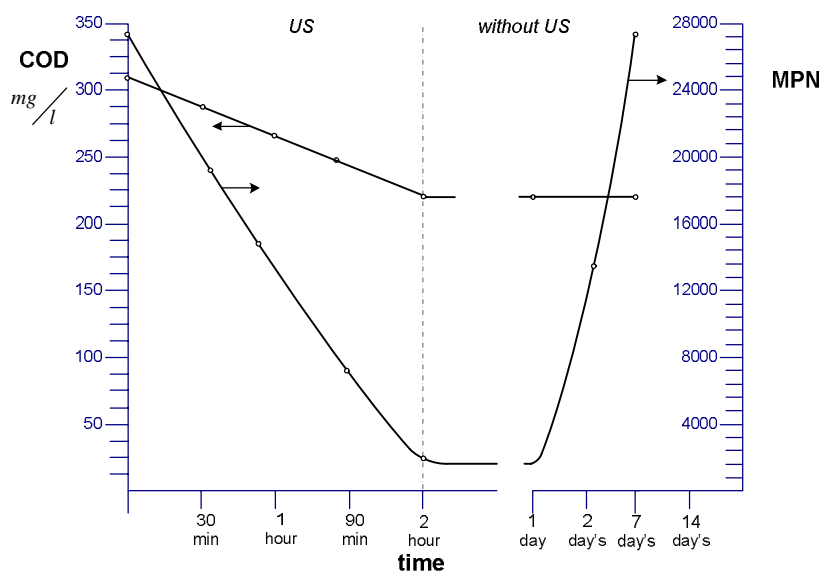


Figure 1: Dependence of COD and MPN changes over time

After ultrasonic treatment of water contaminated with microorganisms and organic compounds post cavitation effect is observed - bacteria growth starts only after exposure for 24 hours, while for water without ultrasonic treatment it begins at the moment when microorganisms are introduced into the water environment.