

Is neutralisation of disinfectants in waste-water necessary?

Discussing ecological aspects of the use of disinfectants the first view is spent to the behaviour of occasionally it is suggested that disinfectant use-solutions should be “neutralised” before being disposed of in the sewage system so as not to harm the microorganisms in the clarification plant. Even in a book “Umweltfreundliche Beschaffung” (= Environmentally friendly procurement), in chapter X6 (The disposal of waste-water by public institutions) such a step is proposed. Neutralisation is not understood here, as is normally usual, as the shift of the pH value of a solution from the alkaline or acidic range to the neutral point (pH 7), but as the inactivation of microbically effective substances.

From the ecological point of view, such a procedure cannot be classified favourably. The following reasons play a role in this:

1. As a result of dilution with other waste-water, disinfectant use-solutions lose their antimicrobial efficacy relatively rapidly. In principle, account must be taken of the fact that only “just effective” substance concentrations are present in the use-solution. Paracelsus’ principle of the dose/effect relationship applies here too.
2. For the inactivation of microbicidal substances, suitable substances tailored to the active substance must be found. In theory, there are selective inactivation substances for all types of substance, but there are also a few more broadly effective substances.

We would point out that such inactivation reactions also take place in waste-water (interaction between quats/anionic surfactants; chlorine/chlorine consumption; active oxygen/reducing agents, etc.).

3. In order to permit a reaction between substance and inactivator in clearly understandable time-spans, the inactivator must be used in excessive amounts. The low substance concentrations in the use-solution cause a slowing of the reactions with reaction partners, which have to be over-compensated by this higher concentration. For example, in a test preparation with an 8-litre bucketful of a 0.5 % solution of an aldehydic surface disinfectant (containing 40 ml concentrate with about 4 g aldehyde), 1 kg (!) of an oxidant had to be added in order to produce a reaction within a realistic period of time.

4. It is reasonable to assume that any substance added to the waste-water is an additional burden on the waste-water, especially in the necessary high dosage. The cost of producing this(these) substance(s) is not even considered here.

Conclusion:

Inactivation of disinfectant use-solutions before they are discharged into the waste-water is not only unnecessary and ineffective, but from the ecological point of view is even counter-productive.

Important for the disposal of disinfectant use-solutions is knowledge of the sewage sludge toxicity and of the degree of further dilution – obtained from a rough estimate – by other waste-water before they reach the clarification plant.

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