

COMPARISON OF TWO OXIDATIVE CLEANERS VERSUS A CLASSICAL ENZYMATIC CLEANER USED IN THE REGENERATION OF MICROFILTRATION MEMBRANES TYPICALLY EMPLOYED FOR THE CLARIFICATION OF ALCOHOLIC BEVERAGES

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ABSTRACT

Crossflow microfiltration is increasingly used to clarify and stabilize wines, beers and juices. Fouling and regeneration of membranes employed in these processes are a true technological barrier [1] which hinders the implementation of crossflow microfiltration in winery, brewery and other beverage industries. Sodium hypochlorite is commonly used as an oxidative agent in detergents and disinfection [2] but rules are increasingly restrictive concerning its use. In this work, hypochlorite is compared to sodium peroxodisulfate, another oxidative agent contained in a patented product and commercial alkaline or enzymes based formulations, on polyethersulfone/polyvinylpyrrolidone (PES/PVP) membranes fouled by rough beer and wine. The peroxodisulfate is already being used in some breweries as an effective alternative to chlorinated products. Comparison criteria are selected to determine the most suitable cleaner for alcoholic beverages such as beer and wine. Tests reveal that the average permeability of membranes after several hours of filtration is higher when sodium hypochlorite is used. Similarly, the water permeability at the end of the regeneration is slightly higher when chlorine is used. However, electron scan microscopy analysis of membranes which have undergone an accelerated ageing in cleaning solutions containing peroxodisulfate or hypochlorite shows that the later degrades the porous media more severely (pore are enlarged and surfaces are evenly degraded). The highest membrane permeability obtained with chlorine must be weighed against their reduced service time. Enzymatic as well as alkaline cleaners do not meet the minimum requirement expected for such membrane regeneration.