

STABILITY STUDY – PERACLEAN® 22 CW (22% Peracetic Acid Solution)

INTRODUCTION

Evonik is one of the world's leading suppliers of Specialty Chemicals. Our active oxygen group brings together Evonik's activities in Specialty Chemicals to a variety of food applications, providing high performance solutions that are both eco-friendly and energy sufficient.

PERACLEAN® 22

PERACLEAN® 22 CW (FCN #1662) which is an eco-friendly approved antimicrobial agent used in the Poultry industry for off-line and on-line reprocessing. The product is also used in chiller tanks as well as in treating poultry parts via dip or spray solution. The product typically contains between 22 and 23% peracetic acid, 4 to 5% hydrogen peroxide as well as a mineral acid and a stabilizer. Although it is a well known fact that PAA is a strong antimicrobial, there has been some debate on how stable 22% peracetic acid solutions are. Some misconceptions that have been published include that a higher concentration of hydrogen peroxide allows for a more stable PAA. In addition, it has also been mentioned that mineral acids such as sulfuric acid, have an adverse effect on stability. As a result of the above concerns Evonik decided to do a long term stability study at an independent commercial laboratory where two competitive 22% formulations were tested for stability along with PERACLEAN® 22 CW. One product contained 5% hydrogen peroxide while the other product contained 10% hydrogen peroxide.

TESTING PROCEDURE

The samples were promptly analyzed upon the laboratory receiving the samples. In each case the samples had a production date where each sample was approximately 3 weeks old. All 3 samples were tested for both hydrogen peroxide and peracetic acid content. Initial testing was performed every 10 days for 90 days. During the sampling intervals the samples were stored at room temperature in vented 1 liter containers. After the initial 90-day testing period, the samples were again tested at 141 days. Hydrogen peroxide was determined by an oxidation reduction titration with Cerium sulfate. After the end point of this titration had been reached an excess of potassium iodide was added to the solution. The hydroiodic acid formed in acidic media reacts with peracetic acid to liberate iodine. A standard solution of sodium thiosulfate was used to titrate the liberated iodine and from this data the peracetic acid content was calculated.

TITRATION RESULTS OF PERACETIC ACID SOLUTIONS

Table 1

Sample		Days										
		0	10	20	30	40	50	60	70	80	90	141
PERACLEAN® 22 CW	H ₂ O ₂	4.71	4.60	4.59	4.75	4.47	4.53	4.63	4.60	4.63	4.53	4.46
	PAA	22.65	22.53	22.68	22.55	22.55	22.30	22.19	22.63	22.12	22.05	21.59
Competitor A	H ₂ O ₂	5.66	5.70	5.60	5.44	5.30	5.21	5.08	5.01	4.84	4.69	4.44
	PAA	21.45	21.29	20.16	19.92	19.42	19.51	18.19	17.89	17.75	16.66	14.21
Competitor B	H ₂ O ₂	10.33	10.30	9.98	10.07	9.85	9.80	9.77	9.62	9.51	9.45	8.95
	PAA	22.47	21.35	21.63	20.72	21.58	21.11	20.36	20.30	19.82	20.05	18.08

TITRATION RESULTS OF PERACETIC ACID SOLUTIONS

Figure 1

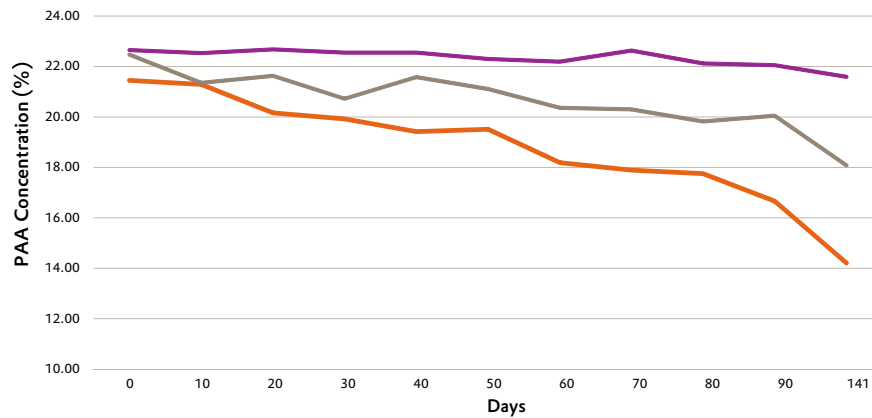
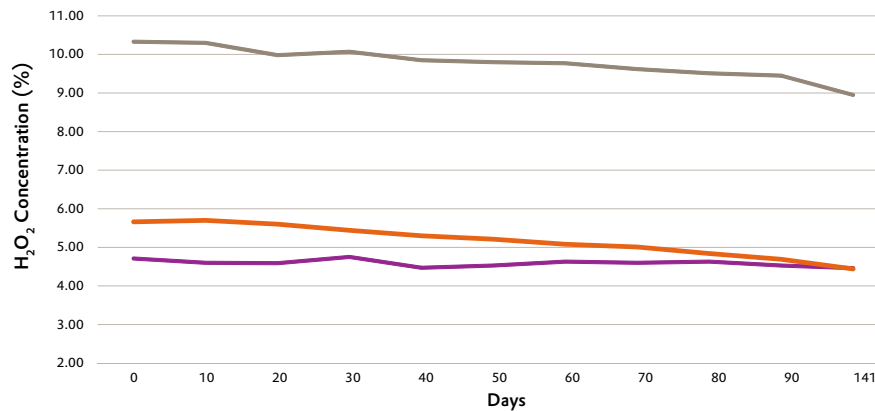


Figure 2



— PERACLEAN® 22 CW — Competitor A — Competitor B

Figure 1 represents the change in PAA content over the entire testing period.

Figure 2 represents the change in hydrogen peroxide over the entire testing period.

RESULTS/CONCLUSIONS

The results clearly show that PERACLEAN® 22 CW is a much more stable product over time and is more effective in removing bacteria such as salmonella and campylobacter. Also as previously reported, neither a higher concentration of hydrogen peroxide nor the presence of a mineral acid had any effect on the stability of PERACLEAN® 22 CW.

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