

Stability of Two Different 22% Peracetic Acid Products

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Introduction

Enviro Tech Chemical Services, Inc. launched Perasan MP-2C which is a 22% peracetic acid (PAA) formulation for use as an antimicrobial intervention in the meat and poultry industry in early 2014. Perasan MP-2C was the most concentrated PAA product on the market for meat and poultry processing. To date, there is only one other 22% PAA product commercially available for meat and poultry processing besides Perasan MP-2C. A previous study determined that the comparative efficacy of the Perasan MP-2C and the other 22% PAA product were virtually identical *against E. coli* O157:H7 inoculated beef surfaces at 200 and 400 ppm PAA but the stability of the products over time appear to be vastly different. The purpose of this study is to determine the comparative stability of the Perasan MP-2C and the other commercially available 22% PAA product¹.

Materials and Methods

Iodometric Testing Protocol

See attached Standard Operating Procedure

A total of six samples of Perasan MP-2C, two samples from three different lots were used for this study. The samples were initially analyzed for PAA and hydrogen peroxide (H₂O₂) concentration via iodometric titration to obtain an initial baseline. 100 mL samples were measured out in a Class A volumetric flask and transferred to glass amber bottle to protect from ultraviolet light. The samples were then placed in a standard laboratory incubator set at 32 ± 1°C and tested weekly.

Six samples of the other 22% PAA product consisting of two samples from three different lots were obtained from a poultry processing facility that is currently using the product. The samples were analyzed for PAA and H₂O₂ via iodometric titration. 100 mL samples were measured out in a Class A volumetric flask and transferred to glass amber bottle to protect from ultraviolet light. The samples were then placed in a standard laboratory incubator set at 32 ± 1°C and tested weekly.

¹ The 22% product name and manufacturer were omitted to maintain anonymity

Results

Table 1 shows the average PAA and H₂O₂ concentrations of the six Perasan MP-2C samples over the 90 day time interval

Description	Day	Avg. PAA Conc. (%)	Avg. H ₂ O ₂ Conc. (%)
Perasan MP-2C	0	22.65	4.85
Perasan MP-2C	8	22.73	4.82
Perasan MP-2C	15	22.72	4.78
Perasan MP-2C	20	22.69	4.87
Perasan MP-2C	30	22.68	4.79
Perasan MP-2C	60	22.81	4.84
Perasan MP-2C	70	22.69	4.75
Perasan MP-2C	80	22.73	4.79
Perasan MP-2C	90	22.65	4.83

Figure 1 is the graphical representation of the data from **Table 1**

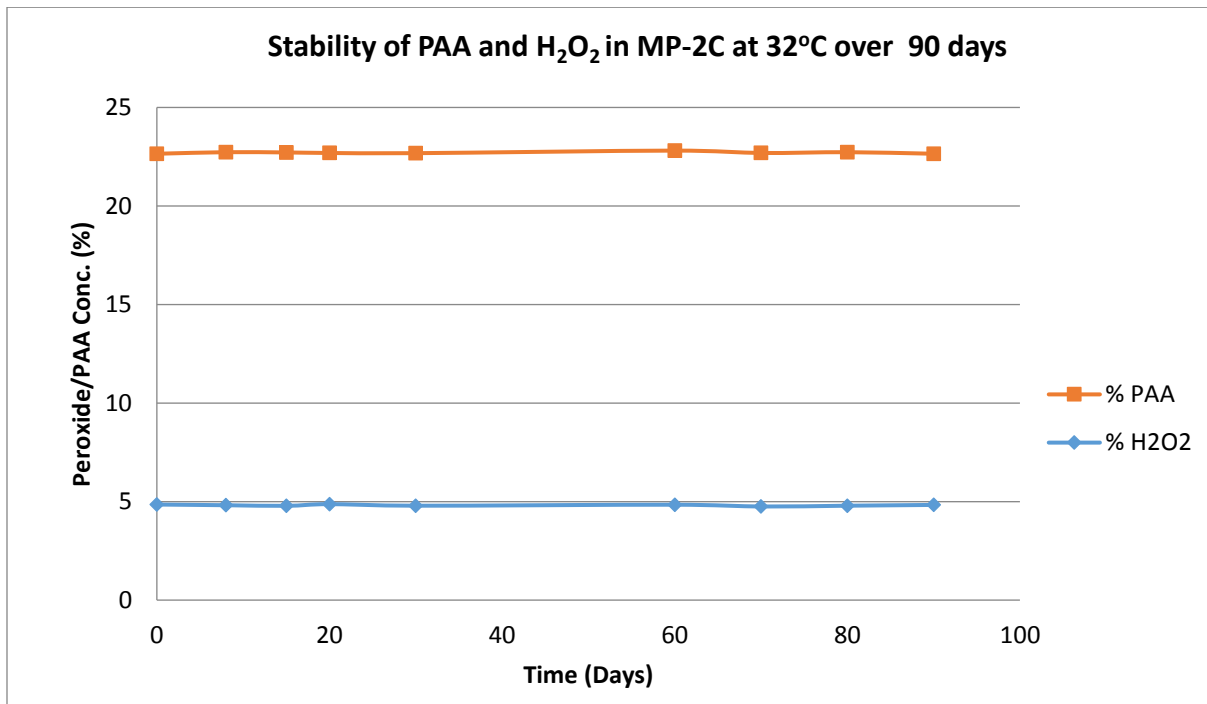
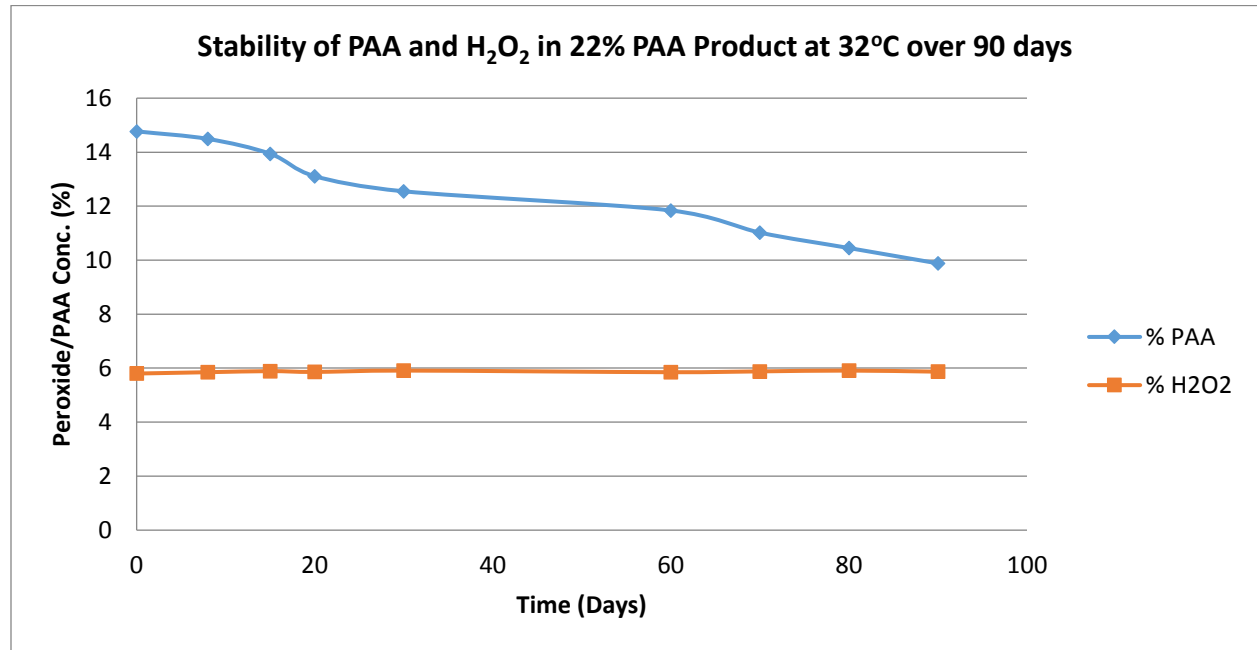


Table 2 shows the average PAA and H₂O₂ concentrations of the six samples of the other 22% PAA product over the 90 day time interval

Description	Day	Avg. PAA Conc. (%)	Avg. H2O2 Conc. (%)
22% PAA Product	0	14.77	5.80
22% PAA Product	8	14.49	5.85
22% PAA Product	15	13.94	5.89
22% PAA Product	20	13.11	5.86
22% PAA Product	30	12.55	5.91
22% PAA Product	60	11.84	5.85
22% PAA Product	70	11.02	5.88
22% PAA Product	80	10.45	5.91
22% PAA Product	90	9.88	5.87

Figure 2 is the graphical representation of the data from **Table 2**



Conclusions

A total of 6 samples of Perasan MP-2C, two samples from each lot, and 6 samples of the other 22% PAA product, two samples from each lot, were tested over a 90 day time interval. The samples were stored in the incubator at 32°C to simulate storage stability over a 1 year time period. The samples were analyzed weekly for PAA and H₂O₂ concentration and the results of the analysis were averaged.

The results of this study suggest that the Perasan MP-2C has far better storage stability compared to the other 22% PAA product. It is commonly known that all peracetic acid products are based on an equilibrium mixture of acetic acid and hydrogen peroxide. Maintaining the stability of a peracetic acid formulation over long periods of time is highly dependent of the ratio of acetic acid and hydrogen

peroxide as well as the quality of the raw materials used. Enviro Tech has been manufacturing peracetic acid based products for almost 20 years so we understand the importance of storage stability.