



## **SHELF LIFE (Stability) ASO<sup>®</sup> Activated Oxygen**

### **Formation of Hydrogen Peroxide (H<sub>2</sub>O<sub>2</sub>) And/Or Chlorine Dioxide (ClO<sub>2</sub>)**

**ASO<sup>®</sup> Accelerated Standard Shelf Life testing for food (nutritional) supplements by BIO2 International, Inc., CA U.S.A. Three (3) samples tested (see below for explanations).**

Month	Color	Taste	Odor	Form	Particulates	ASO <sup>®</sup> mg/L	% Change	pH
1	Clear	Salty	Halogen	Liquid	None	250,000	0	7.4
6	Clear	Salty	Halogen	Liquid	None	250,000	0	7.4
12	Clear	Salty	Halogen	Liquid	None	250,000	0	7.4
18	Clear	Salty	Halogen	Liquid	None	250,000	0	7.4
24	Clear	Salty	Halogen	Liquid	None	250,000	0	7.4

Product samples maintained at the following base temperatures of:

67° F (20° C) ± 1.75° @ 50% humidity

77° F (25° C) ± 1.75° @ 60% humidity

104° F (40° C) ± 1.75° @ 75% humidity

Note that there were no statistically significant data in any of the three (3) samples tested regardless of temperature or humidity differences.

LaMotte Instrument Co. HP40 Code 3188 and Lamotte Instrument Co. Model EDO Code 7414 Dissolved Oxygen Test Kits.

Source: Lamotte Instrument Co., Chestertown, MD 21620.

**ClO<sub>2</sub> and/or H<sub>2</sub>O<sub>2</sub> Formation: Accelerated Standard Shelf Life testing for food (nutritional) supplements by BIO2 International, Inc., CA U.S.A.**

Month	ClO <sub>2</sub> mg/L	% Change	H <sub>2</sub> O <sub>2</sub> mg/L	% Change
1	0	0	0	0
6	0	0	0	0
12	0	0	0	0
18	0	0	0	0
24	0	0	0	0

Note that there was no formation of either Hydrogen Peroxide (H<sub>2</sub>O<sub>2</sub>) nor Chlorine Dioxide (ClO<sub>2</sub>) during the test period in the solution of ASO® in sample batches SK0921-1-05 and sample batch SK1115-01-05 and no statistical measurable differences in the data between these two (2) sample batches.

For H<sub>2</sub>O<sub>2</sub>: LaMotte Instrument Co. HP40 Code 3188 and Lamotte Instrument Co. Model EDO Code 7414 Dissolved Oxygen Test Kits.

For ClO<sub>2</sub>: LaMotte Instrument Co. Model 3622 OctaSlide and Lamotte Instrument Co. Model 3002 Chlorine Dioxide Insta Test Strips Test Kits.

Source: Lamotte Instrument Co., Chestertown, MD 21620.

The above information is provided for reference purposes only by BIO2 International, Inc. All products meet or exceed minimum quality control and ingredient standards established by the U.S. Food and Drug Administration governing the manufacture and sale for distribution of dietary supplements and health and beauty products.

Shelf-life refers to the average amount of time ASO® may be stored without nutritional or organoleptic (sensory) deterioration. A food product can deteriorate for several reasons: aging, microbiological decay, chemical and physical degradation, texture changes, etc. These modes of deterioration are affected by many factors, both intrinsic (of or within the product) and extrinsic (environmental or outside the product). Controlling processing, packaging, handling and storing of the product can slow deterioration of food products. BIO2's expiration safety date refers to the length of time ASO® can be expected to last without significant deterioration.

The dates assigned to ASO® are based on intrinsic and extrinsic factors, and determined by systematic study or empirical data. Systematic studies are designed to simulate actual or potential storage and handling practices of a given product and estimate shelf life through the course of chemical and analytical testing at specific intervals throughout the expected shelf life. Systematic studies may also rely on accelerated testing when dealing with ASO® with expected long shelf lives. In some cases, shelf life evaluations can be made based on existing information, or empirical data.

Primary shelf life tests conducted on ASO® have been conducted by independent laboratories on standard test microorganisms. These reports are available, upon request, from BIO2 International, Inc.

Note that neither Hydrogen Peroxide nor Chlorine Dioxide is approved for human consumption as a dietary supplement or as a food additive by the U.S.F.D.A. The test data described above does not, in any way, or in any manner, recommend the use of Hydrogen Peroxide or Chlorine Dioxide for human consumption. This information is only proved for product stability comparisons.



Stephen R. Krauss, Ph.D.  
President  
BIO2 International, Inc.

October 30, 2006

## Addendum A: Raw Archival Shelf-Life Data

Detectable Amounts of Oxygen in mg/L  
67° F (20° C) ± 1.75° @ 50% humidity

Days	Control mg/L	% Change	ASO® mg/L	ASO®% Change	ClO2 mg/L	% Change	H2O2 mg/L	% Change
0	4	0	250,000	0	0	0	0	0
30	3	25%	250,000	0	0	0	0	0
60	3	0	250,000	0	0	0	0	0
90	3	0	250,000	0	0	0	0	0
120	3	0	250,000	0	0	0	0	0
150	3	0	250,000	0	0	0	0	0
180	3	0	250,000	0	0	0	0	0
210	3	0	250,000	0	0	0	0	0
240	3	0	250,000	0	0	0	0	0
270	3	0	250,000	0	0	0	0	0
300	3	0	250,000	0	0	0	0	0
330	3	0	250,000	0	0	0	0	0
360	3	0	250,000	0	0	0	0	0
390	3	0	250,000	0	0	0	0	0
410	3	0	250,000	0	0	0	0	0
430	3	0	250,000	0	0	0	0	0
460	3	0	250,000	0	0	0	0	0
490	3	0	250,000	0	0	0	0	0
510	3	0	250,000	0	0	0	0	0
540	3	0	250,000	0	0	0	0	0
570	3	0	250,000	0	0	0	0	0
600	3	0	250,000	0	0	0	0	0

630	3	0	250.000	0	0	0	0	0
660	3	0	250.000	0	0	0	0	0
690	3	0	250.000	0	0	0	0	0
720	3	0	250.000	0	0	0	0	0
750	3	0	250.000	0	0	0	0	0

**Addendum B:  
Raw Archival Shelf-Life Data**

Detectable Amounts of Oxygen in mg/L  
77° F (25° C) ± 1.75° @ 60% humidity

Days	Control mg/L	% Change	ASO® mg/L	ASO®% Change	ClO2 mg/L	% Change	H2O2 mg/L	% Change
0	4	0	250,000	0	0	0	0	0
30	3	25%	250,000	0	0	0	0	0
60	3	0	250,000	0	0	0	0	0
90	3	0	250,000	0	0	0	0	0
120	3	0	250.000	0	0	0	0	0
150	3	0	250.000	0	0	0	0	0
180	3	0	250.000	0	0	0	0	0
210	3	0	250.000	0	0	0	0	0
240	3	0	250.000	0	0	0	0	0
270	3	0	250.000	0	0	0	0	0
300	3	0	250.000	0	0	0	0	0
330	3	0	250.000	0	0	0	0	0
360	3	0	250.000	0	0	0	0	0
390	3	0	250.000	0	0	0	0	0
410	3	0	250.000	0	0	0	0	0

430	3	0	250.000	0	0	0	0	0
460	3	0	250.000	0	0	0	0	0
490	3	0	250.000	0	0	0	0	0
510	3	0	250.000	0	0	0	0	0
540	3	0	250.000	0	0	0	0	0
570	3	0	250.000	0	0	0	0	0
600	3	0	250.000	0	0	0	0	0
630	3	0	250.000	0	0	0	0	0
660	3	0	250.000	0	0	0	0	0
690	3	0	250.000	0	0	0	0	0
720	3	0	250.000	0	0	0	0	0
750	3	0	250.000	0	0	0	0	0

**Addendum C:  
Raw Archival Shelf-Life Data**

Detectable Amounts of Oxygen in mg/L  
104° F (40° C) ± 1.75° @ 75% humidity

Days	Control mg/L	% Change	ASO® mg/L	ASO®% Change	ClO2 mg/L	% Change	H2O2 mg/L	% Change
0	4	0	250,000	0	0	0	0	0
30	3	25%	250,000	0	0	0	0	0
60	3	0	250,000	0	0	0	0	0
90	3	0	250,000	0	0	0	0	0
120	3	0	250.000	0	0	0	0	0
150	3	0	250.000	0	0	0	0	0
180	3	0	250.000	0	0	0	0	0
210	3	0	250.000	0	0	0	0	0

240	3	0	250.000	0	0	0	0	0
270	3	0	250.000	0	0	0	0	0
300	3	0	250.000	0	0	0	0	0
330	3	0	250.000	0	0	0	0	0
360	3	0	250.000	0	0	0	0	0
390	3	0	250.000	0	0	0	0	0
410	3	0	250.000	0	0	0	0	0
430	3	0	250.000	0	0	0	0	0
460	3	0	250.000	0	0	0	0	0
490	3	0	250.000	0	0	0	0	0
510	3	0	250.000	0	0	0	0	0
540	3	0	250.000	0	0	0	0	0
570	3	0	250.000	0	0	0	0	0
600	3	0	250.000	0	0	0	0	0
630	3	0	250.000	0	0	0	0	0
660	3	0	250.000	0	0	0	0	0
690	3	0	250.000	0	0	0	0	0
720	3	0	250.000	0	0	0	0	0
750	3	0	250.000	0	0	0	0	0

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