

# OXYRASE – Nature’s Antioxidant ®



Link to Oxyrase website



Contact Information:

Dr. Jim Copeland 419-589-8800 Ext.225

Troy Menssen 419-589-8800 Ext 231

## **Oxyrase - Nature's Antioxidant®**

Wine fermentation is an anaerobic process. Many of the nuances of wine are found in flavors generated during fermentation. This may be related to grapes used, the strain of yeast fermenting the juice, and the vintner's practices. What we do know is that delicate flavors are generated anaerobically. Those flavors can be negatively altered by oxidation. For this reason, every effort is used to keep oxygen from infiltrating wine. Once wine is oxidized, there is no way to reverse the process.

Wine is exposed to oxygen when it is pumped from the fermenter, when it is bottled, and when closures are faulty. Complex processes were developed to overcome these problems. Oxyrase could simplify these processes and eliminate the problems. Oxyrase removes oxygen down to very low levels.

Wine is a very selective environment: it is anaerobic, it is high in alcohol content, and it has a low pH. Together these conditions stop bacteria from growing in wine. Oxyrase works in all of these conditions.

Sulfites are added to wine to remove oxygen, it acts as an antioxidant, and to prevent bacterial growth, it acts as a preservative. Wine is naturally selective, making sulfites not necessary as a preservative. Oxyrase is a safe antioxidant in wine, making adding sulfites to wine unnecessary.

The active ingredient when sulfite is added to wine is sulfur dioxide. It is formed in acidic wine. Sulfur dioxide is lethal to humans at levels of 100 ppm. There is no antidote for sulfur dioxide. Twelve people have died from consuming sulfites in salads. Since 1986, the FDA banned the use of sulfites in salad bars. Many people do not drink wine because it contains sulfite.

You may ask, what is Oxyrase? It is an enzyme, a natural catalyst, found in all living things that use oxygen. We isolate it from microorganisms, purify it, standardize its activity, and provide it as a product. Oxyrase is a sterile product, which means it does not contain bacteria.

Oxyrase acts as an antioxidant, it reduces oxygen to water. It uses natural substrates found in wine, such as lactate and glucose, as hydrogen donors to reduce oxygen. If not removed, oxygen would react with substances in wine and could change flavor or color of the wine.

We isolate Oxyrase from a GRAS microorganism, which is generally regarded as safe by the FDA. We have petitioned the FDA to recognize Oxyrase as a GRAS substance. When recognized, Oxyrase could be used as a food processing aid. It would protect wine, as well as other food products from changes due to oxidation.

We make Oxyrase to sell to other manufacturers who include it in their products to extend shelf life. We also make bacteriological media containing Oxyrase that is used for isolating and

growing anaerobe bacteria in hospital laboratories (see [www.oxyrase.com](http://www.oxyrase.com)).

Oxyrase is a natural product found in most foods we eat every day. It is healthy and wholesome. You have a choice. Now is the time to stop using sulfites in wine and to start using Oxyrase.

## Figure Legends

For these charts 100% dissolved oxygen is equivalent to oxygen saturation at 20C in water, which is 8 mg/L of dissolved oxygen. This is equivalent to 8 ppM (parts per million). At 0%, the amount of dissolved oxygen is equated to the turning point of methylene blue when it turns white in the absence of oxygen. That is equivalent to 0.008 mg/L of dissolved oxygen, which is equivalent to 8 ppB (parts per Billion).

In this test, wine is oxygenated to saturation. Then it is placed in a cell of an OxyGraph. Measured Oxyrase is introduced and the rate of oxygen reduction is measured and recorded.

### 1. Organic Red Wine, 1 u/mL Oxyrase

In certified Organic Red Wine, it took about 50 minutes to remove all dissolved oxygen at 20 C. The average rate of reduction is 0.16 mg/L/min.

### 2. Organic Red Wine, 0.1 u/mL Oxyrase

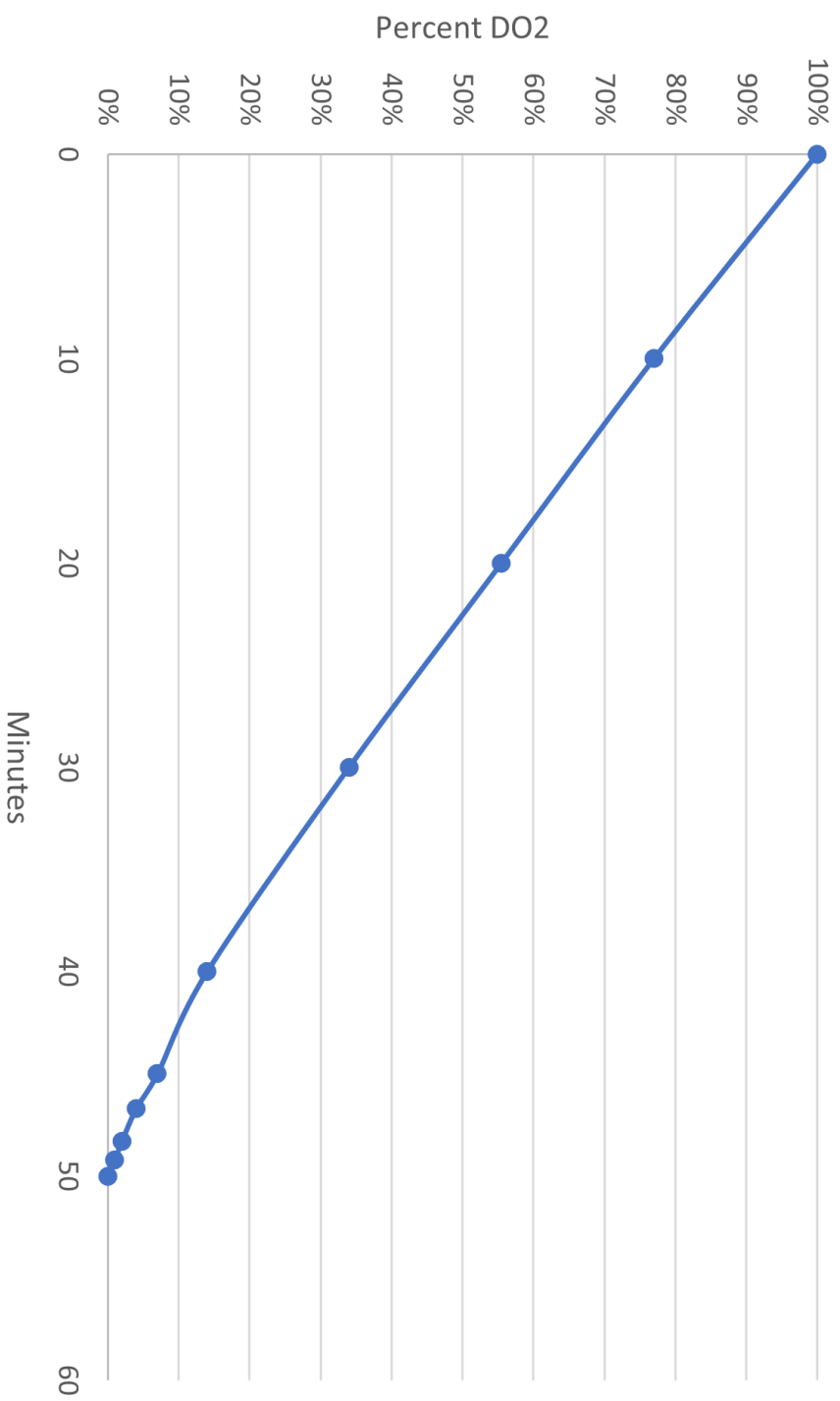
In this chart the amount of Oxyrase is reduced 10-fold to 0.1 u/mL. At 20 C it took 720 minutes to remove the dissolved oxygen to about 40 ppB. The average rate of reduction is 0.01 mg/L/min.

The efficiency of oxygen reduction is lower by using a lower amount of Oxyrase. This is due to fewer enzyme molecules reacting with a lowering number of oxygen molecules during the reaction. The rate of oxygen reduction is lower with lower amounts of Oxyrase. Oxyrase can reduce dissolved oxygen by as much as 1,000X.

Bottled wine may be infiltrated with low amounts of oxygen. Oxyrase can remove that low amount of dissolved oxygen at room temperature. One could increase the rate of reaction of Oxyrase by increasing temperature (30 C) of the bottled wine for a short time (hours).

You put a lot of time and money fermenting your wine. You take pride in providing a quality product to your customers. Assure that quality is maintained to the time your wine is consumed. Protect it from oxidation safely. Use Oxyrase.

## Organic Red Wine, 1 u/mL Oxyrase



# Organic Red Wine, 0.1 u/mL OxYrase

