

What is Ozone?

Ozone is an unstable form of oxygen. Normal oxygen is diatomic (O_2) existing as two atoms of oxygen making up the molecule. Ozone is triatomic (O_3) existing as three atoms of oxygen for the molecule. The triatomic form of oxygen is very unstable, wanting to lose the third oxygen atom and combine with whatever atom possible (oxidization). This property makes it the most active oxidizer known with the exception of the very hazardous fluorine gas.

Ozone is an odorless and colorless gas at normal pressures, but under pressure it becomes a bluish gas. It produces the pleasing fresh air smell generated after an old-fashioned thunderstorm, as ozone is created from the high-voltage lightning discharges.

Ozone is also a very powerful bactericide. It is not affected by pH as is chlorine thus making it an excellent candidate for pools, spas, laundries and general water treatment applications. It is many times more soluble in water further enhancing its purifying effect. Ozone will combine with diatomic nitrogen N_2 forming nitrous oxide $2NO$. This oxide quickly combines with water forming nitric acid HNO_3 . This is often a very undesirable effect when used with straight air. Pure oxygen greatly minimizes this effect and is often required in many applications.

However those requiring a supply of concentrated nitric acid for nitration etc. may wish to consider ozone and air with a condensing apparatus to obtain this useful acid.

Ozone For Water Applications

It is estimated that 20% of all ground water is contaminated by pesticides, benzene and phenol derivatives along with other undesirable organic substances. Ozone will oxidize many of these compounds along with deactivating many viruses and harmful bacteria. Ozone will also oxidize many inorganic compounds such as iron and manganese making them more easily removable by filtration.

Chlorine and bromine is often the choice of disinfectant for swimming pools, and spas. The effect of these halogens is often dictated by pH, temperature and agitation. Extreme heat and agitation can produce chloroform, a very toxic carcinogen. The EPA is already taking a dim look at these chemicals for this use.

Ozonated water will destroy fungus, mold and many pathogens found in water when used for washing fruits and vegetables in packing lines. When discharged, ozone causes little change to the beneficial bacteria in sewage treatment facilities.

Freshly caught fish will last longer when washed with ozone treated water. The odors from the storing cheese can be eliminated by the oxidizing action of ozone. Egg storage time is increased, wine can be aged faster. The removal of odors produced by bleaching of beeswax starch, flour, straw, bones, feathers etc. are all aided by ozone treatment. The grease and wax on cotton and wool fibers are decomposed by ozone. Gray mold on the surface of fruits and vegetables is controlled by ozone.

Ozone For Treating Air

Air pollution is one of the more serious environmental issues that we all face, especially in the more densely populated areas. Visible and detectable smoke, dust, mildew, mold, toxic and annoying odors – along with the more elusive and invisible chemicals, bacteria, pollen and static electricity – have become a serious health threat. As buildings and homes construction are made tighter and more air sealed for energy conservation, the issue of air quality will become even more pronounced. Often the effects of burning eyes, headaches, dizziness, depression, allergies and general lethargy are attributed to colds and viruses. Air filters are only partially effective, with some producing undesirable positive ions: examples are to be found in many of the overpriced units currently being advertised by other companies.

Ozone is produced by electricity and purifies the air from these undesirable pollutants by oxidization as most readily combine with this highly reactive triatomic form of oxygen and break down into water and other non-toxic compounds.

Available Ozone Systems

Information Unlimited offers low cost ready to use home use air ozonating systems suitable for many applications. Also offered are completed water treatment systems along with individually available power supplies and ozone producing cells of all sizes for the potential system manufacturer.