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Century 21 – Pregnant with Ozone

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Abstract

As we enter this new century, it is striking how the number of applications for ozone is growing. During ozone's first century, the emphasis for using it involved primarily, potable water treatment, wastewater treatment, bottled water treatment, odor control and medical therapy. Of these, potable water and wastewater treatment now can be called the "classical" applications for ozone. But there are a great many more uses for this versatile chemical that might be termed "non-classical", and these began emerging toward the end of the last century. Some of these so-called "non-classical" developing applications for ozone will be reviewed in this paper. As we enter the 21st century, applications for ozone in the various aspects of the agricultural and food processing industries are very active and most promising.

Key Words

Ozone; Odor Control; Fumigation; Semiconductor Applications; Pulp Bleaching; Film Treatment; Kaolin Bleaching; Textile Bleaching; NOx Removal; Catalyst Regeneration; Organic Oxidation; Inorganic Oxidation; Laundry Applications; Agricultural Applications; Food Applications; Shoe Disinfection;

Introduction

The fascination with ozone began in the late 1800s with initial commercialization (Nice, France) in 1906. This versatile gas has the capability to both disinfect and to oxidize while returning to harmless oxygen from which it began its career. No wonder the fascination with ozone.

Yet those three aspects (disinfectant, oxidizing agent, environmentally friendly) of ozone are both blessings and curses. Their blessings come when all aspects of ozone are understood by its proponents and users, so that equipment and processes for its applications are well designed and operated properly. But when these design (or operation) aspects are ignored, the ozone "industry" will be the recipient of the curses of ozone – under-design, improper application, and poor attention to safety aspects of its use. There may always be people offering inferior ozonation equipment, or offering undersized ozone generators for a particular application. On the other hand, today there are more ozone-knowledgeable people and firms than ever before. This has helped the growth of ozone in its many applications during the past century.

In this paper, the author will focus on the many non-water and wastewater applications for ozone (see Table I). Since ozone is a gas, many applications take place by treating solid surfaces with gaseous ozone. Still other applications involve adding ozone to a liquid and then applying the solution to a surface.