Bachelor’s Thesis

Systematic Investigation of the Antibacterial Effects of Ozone for Medical Therapy

Medical gases, such as ozone, are utilized in pain therapy as an alternative to surgical or medical treatment. Thereby, ozone can be applied for the treatment of herniated disks, chronic wounds, coronary or peripheral artery disease, or osteoarthritis. For the treatment of chronic wounds, the antibacterial properties of ozone are applied. As antibiotic resistance is a growing problem, new treatment options are essential to ensure that chronic wounds can be treated effectively. Ozone is promising for the treatment of methicillin-resistant staphylococcus aureus (MRSA). In addition, ozone can also be utilized in the removal of MRSA bacteria in hospitals or contaminated homes.

The goal of the thesis is to perform a systematic investigation of the antibacterial effects of ozone and summarize the current state of the art. This includes an overview of germs on which ozone has an antibacterial effect. Also included is a summary of the parameters (temperature, concentration, pH value, exposure time, ...) that have been varied in previous research. Another highly significant contribution is to investigate whether there are germs that are resistant to ozone.

Tasks:
- Literature review:
  - Which germs does ozone have an antibacterial effect on?
  - Which parameter variation has already been investigated in previous research?
  - Are there germs that have developed resistance to ozone? Do the germs adapt to the stressors?
- Investigation and comparison of the current state of the art on the antibacterial effects of ozone

Requirements:
- Highly self-motivated student interested in medical technology
- Thesis can be written in English or German