**Plasma Ozone and Ozonized Oils in Skin Diseases**

1. **Introduction**

The increase of ageing, obesity, and diabetes in conjunction with inappropriate healthcare programs have emphasized the problem of having to treat almost 1.5 billion people affected by skin and mucosal infections due to bacteria, viruses, protozoa, and dysmetabolism

1. Diabetic foot (ulcer with necrosis)
2. Bed sores
3. Ulcers after a trauma or burns
4. Chronic viral infections
5. Herpes virus I and II
6. Human papilloma viruses
7. Vaginal infections now frequent also in young girls due to *Candida*, *Trichomonas*, and *Chlamidia*
8. Rectal mucosa infections such as anal ragadis
9. Abscesses
10. Mouth aphthous ulcers
11. Methicillin-resistant *Staphylococcus aureus*
12. *Pseudomonas aeruginosa*
13. inflammation, tissue proliferation, and remodeling

The judicious use of ozone (O3) appears providential because first of all eliminates the pathogens and then, by releasing oxygen (O2), activates the proliferation of fibroblasts, hence the building of intercellular matrix with

consequent proliferation of keratinoblasts and successive healing.

**2. Physical Chemistry of Oil Ozonation with a Description of the Analytical Methods for**

**Characterizing the Process**

Briefly, the postulated mechanism known as **Criegee reaction** provides that ozone combines with an unsaturated

bond to form an initial, unstable primary ozonized which readily decomposes to form a zwitterions and a carbonyl

fragment.

In anhydrous environment these substrates combine to give the typical **cyclic trioxolane derivative**.

In fact, from a therapeutic point of view, the ozonide compositions have the capacity to deliver active O2 and/or other useful species deep within the lesion without causing primary skin irritation.

**ozonized sesame oil** on acute cutaneous wound healing

both low (*<*1000) and high doses (*>*3000), as expressed in terms of peroxide value

“middle” concentration (about 1500) has the most beneficial effect in accelerating the wound closure ratio.

ozonated derivatives depends upon several parameters, such as:

1. the type and the quality of ozone generators;

(ii) the ozonation conditions, in terms of reactors and time, material type and amount, presence of water and/or

catalyzers;

(iii) the efficacy of the ozonizer, in terms of O3 concentration output, gas flow, gas carrier. As for the

latter, the use of medical grade O2 instead of air is an important point to be considered; in fact, air feedstock

(containing about 78% of nitrogen) used for the **Ozonation of unsaturated substrates** could lead to the production

of potentially **toxic nitrated by-products** .

Ozonized oil has to be unequivocally characterized in terms of the species contents as well as the reaction kinetics.

during the oil ozonation, in particular the decrease of the bands corresponding to both **C*=*C and =C–H** stretching (e.g., sesame oil at 1654 cm*−*1 and 3009 cm*−*1, respe), and the increase of the band corresponding to ozonide CO stretching (e.g., sesame oil at 1105 cm*−*1).



1. **Cutaneous Responses to Environmental Ozone Exposure**

***Peroxide Value.***

Peroxide value, (PV), is usually used as an indicator of the advancement and/or the control of the Ozonation process because of its simplicity, rapidity, and low cost. Moreover, the PV may be adequate for the stability evaluation of vegetable oil ozonides and it appears to be very important for commercial distribution as well as for the determination of the better storage modalities.