

60 / 140 vs 3.4 nanometers: detection, transferal and destruction of SARS CoV-2

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While, to date, SARS CoV-2 does not seem to vaporize, infections have been observed in health care professionals confined to intermediate and intensive care environments.^[1] On one side, studies evidence a size for SARS CoV-2 of 60-140 nm^[2]; on the other, AIR is a mixture of gases that includes mostly molecules of nitrogen, oxygen and argon^[3]; the sizes of all of these are of approximately 3.4 nanometers^[4]. Oxygen is used in health care as a therapeutic medical gas for respiratory diseases^[5].

This work proposes:

- The **detection** of SARS CoV-2 through three different **electronic nose** technologies: (a) IMS (Ion Mobility Spectrometry)^[6] with a Bradbury Nielsen gate and a dedicated “IMS cell”; (b) an e-Plasma-Nose^[7] integrated to a HR400 Ocean Optics® spectrometer and a 4.2 KV direct corona discharge ionization source; and (c) an eMed-Nose^[8] of six carbon-based nanosensors, manufactured locally by Argentum Τεχνη, mounted on a glass surface with a “fishtail” layout within an airtight chamber that receives the laser-evaporated sample transported by a nitrogen gas carrier, generated by a portable equipment developed by Argentum Τεχνη with an Airrane® membrane;
- The **transfer and destruction**, conducted simultaneously, through **molecular adsorption** –PSA^[9] – of air for the onsite production and supply of medical grade gas oxygen at these same confined, intermediate and intensive care units. This is achieved by PSA OXIAIR® plants^[10] that are installed and operational at the following hospitals: “Eva Perón” located in Benito Juárez, Dr. Pedro Orellana located in Trenque Lauquen, both in the Province of Buenos Aires, and at the Hospital Dr. Eleazar Herrera Motta located in Chilecito, in the Province of La Rioja.

References

^[1] and ^[5] Argentine Society for Intensive Care. Chapter on Critical Nursing. Clinical Practice Protocols and Guidelines. RESPIRATORY CARE IN CRITICAL PATIENTS.

^[2] Features, Evaluation and Treatment Coronavirus (COVID-19).

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[3]

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[4]

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Electronic noses

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- ^[6] IMS Ion Mobility Spectrometry, Dr. Carlos Rinaldi et al.
- ^[7] ePlasma-Nose; Dr. Carlos Rinaldi et al.
- ^[8] eMed-Nose; Argentum Τεχνη- Dr. Carlos Rinaldi et al

[9] THE OXYGEN MOLECULE: Technology, Economy and Institution, Ricardo Daniel De Simone, Engr.

- 14th International Scientific Congress CNIC 2005, Palacio de Convenciones, Havana, Cuba – June 27 - 30, 2005”
- AirSep International Distributor Forum- 260 Creekside Drive Buffalo, NY 14228-2075, USA – July 26 - 30, 2005”.
- Argentine Nanotechnology Foundation – “II GATHERING OF NANOMERCOSUR 2009: Opportunities for Micro and Nanotechnology” – INVABIO, www.invabio.com.ar – Palacio San Miguel, C.A.B.A., Argentina, August 2009

PSA OXIAIR® Plants ^[10] y ^[5] installed and operational in the following hospitals:

- “Eva Perón” located in Benito Juárez
 - Provision 003340 - Division of Medical Technology, Health Department of the Province of Buenos Aires - La Plata, December 16th, 2014 “Laboratory of Medicinal Products for the Production of Medical Grade Oxygen through air separation (PSA)”
- Dr. Pedro Orellana located in Trenque Lauquen
- Dr. Eleazar Herrera Motta located in Chilecito