USING COLD PLASMA PRODUCED BY PANCUANTIC CONVERTERS

POLLUTION REDUCTION

www.pancuantic.ro

GASEOUS POLLUTANTS AND AIR POLLUTION

SMOG is a type of air pollution derived from **vehicular and aircraft emission** from internal combustion emission and industrial fumes that react in the atmosphere with sunlight to form secondary pollutants that also combine with the primary emissions to form **PHOTOCHEMICAL SMOG** is also caused by large amounts of **coal burning** in an area caused by a mixture of smoke and **SO_2 (sulfur dioxide).** The compound when sunlight hits various pollutants in the air forms a mix of inimical chemicals that can be very dangerous.

A **PHOTOCHEMICAL SMOG** is the chemical reaction of sunlight, **NO_x (nitrogen oxides)** and **VOCs (Volatile Organic Compounds)** in the atmosphere, which leaves **airborne particles (called particle matter**) and **ground-level ozone, O_3.**

Nitrogen oxides, NO_x, are released by nitrogen and oxygen in the air reacting together under high temperature such as in the exhaust of fossil fuel - burning engines in vehicles, trucks, coal power plants, and industrial manufacturing factories.

SOLID AND LIQUID POLLUANTS AND AIR POLUTION

TOXIC, ACID OR RADIOACTIVE PRECIPITATION

Quite often, along with gaseous pollutants, the **dust** and/or the **toxic or radioactive aerosols** formed from solid particles or droplets generated by the pollution sources are released in the air.

After travelling long distances, most air pollutants are eventually "washed" by rain, snow or fog thus forming **the acid / toxic rain, snow or fog** which, in turn, pollute the soil, the subsoil and the surface and underground water sources.

MICROBIOLOGICAL POLLUANTS AND AIR POLLUTION

Microbial pollution is a key component of the air pollution of the buildings and rooms inside. The cause of this pollution type is the presence of hundreds of microbial species (viruses, bacteria and fungus, especially filamentous fungi - mould) that grow inside the building when there is enough moisture.

In the hospitals, care centers, retirement homes and other special indoor environments, air microbial pollution affects population groups (children, adults, elders, patients) who are particularly vulnerable due to their health status or age.

Also do not neglect the effects of air microbial pollution in crowded spaces or production spaces as: schools, offices, entertainment and sports halls, supermarkets, food processing plants, drug factories, farms, etc.

The exposure to microbial contaminants is clinically associated with respiratory symptoms, allergies, asthma and immune reactions. The clinical evaluation shows that 94% of respiratory diseases are caused by microbial air pollution.

The moisture in living areas can also promote the emission of the harmful substances from the construction materials which, in turn, are able to stimulate inflammatory processes in the airways.

The risk of the respiratory allergies should be considered, especially when it comes to children. Another example is *the* ***Legionella*** – the bacteria considered to be the main agent that causes the ***Legionnaire's Disease*** and its milder form called the ***Pontiac Fever***. This bacteria is transmitted by air and it is easily inhaled. Studies show that an important source of spread of this bacteria is represented by the cooling towers and air conditioners.

MICROORGANISMS CLASSIFICATION

1. USEFUL MICROORGANISMS

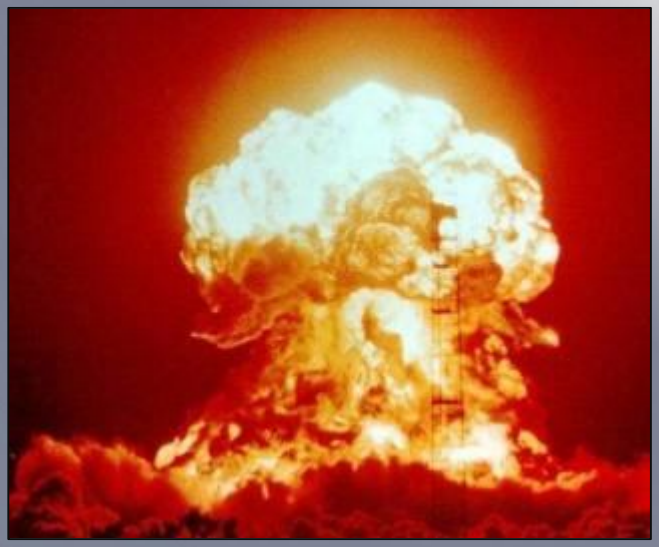
For example: used for rising bread and fermenting wine (yeast), for fermenting milk (lactobacillus), manufacture of antibiotics (penicillinium), etc.

2. PATHOGENS - ARE THE CAUSE FOR DISEASE, INFECTION, POISONING

For example: pneumonia, salmonellosis, tuberculosis, aspergillosis, aflatoxin poisoning, candida albicans, etc.

3**. THERE ARE MICROORGANISMS, ALTHOUGH NOT PATHOGENIC, THAT MAY PRODUCE NEGATIVE EFFECTS, SUCH AS**:

- Alter food;
- Damage clothing, shoes and other objects;
- Adversely change the environment, they appear on the walls of the rooms.



RADIOACTIVE POLLUTION

- RADIATION AND RADIONUCLIDE'S

THE RADIATIONS are everywhere in nature and can be divided into **non-ionizing radiation** (radio waves, light, microwaves, etc.) and **ionizing radiation** (X-rays used in medical diagnostic purposes, gamma rays used for therapeutic purposes, etc.).

The radiations represent a flow of mobile particles (corpuscles and / or photons).

The radioactive pollution occurs due to radiation propagation and emission into space. These radiations can affect the living organisms by producing unwanted physical, chemical and biological effects.

Radioactive substances – *radionuclides, radioisotopes, radioactive isotopes* - are among the most dangerous toxic substances.

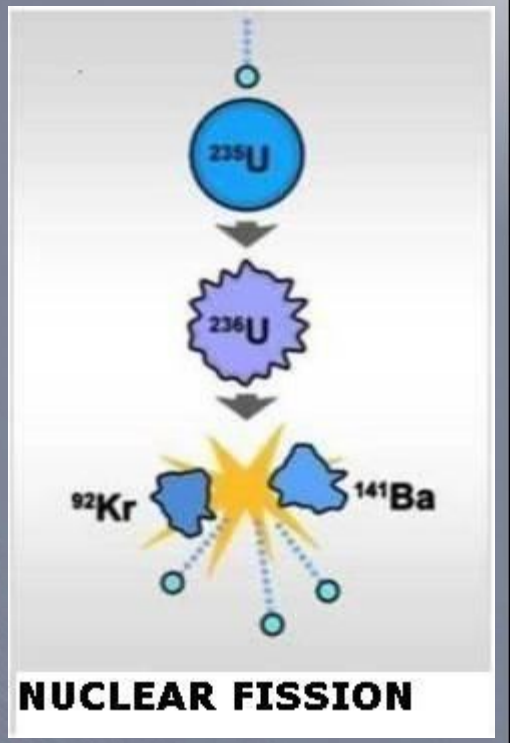
URANIUM

•**Uranium** is a relative reactive chemical reagent and it easily combines with oxygen, sulphur, chlorine, fluorine, phosphorus and bromine.

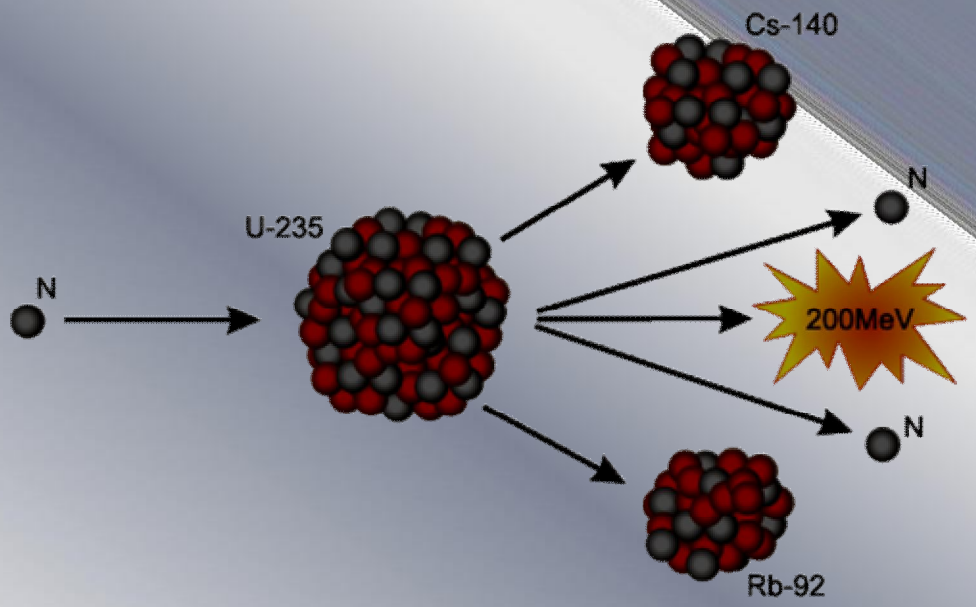
• In radioactive dust and radioactive emissions and radioactive dust it is usually found in metal oxides compound form: UO_2, U_3O_8, UO_3.

• In any of its compounds, uranium shows both chemical toxicity (like heavy metals) and radioactive toxicity.

• The metallic uranium state is highly flammable and reacts violently with air and water oxidation.



NUCLEAR FISSION



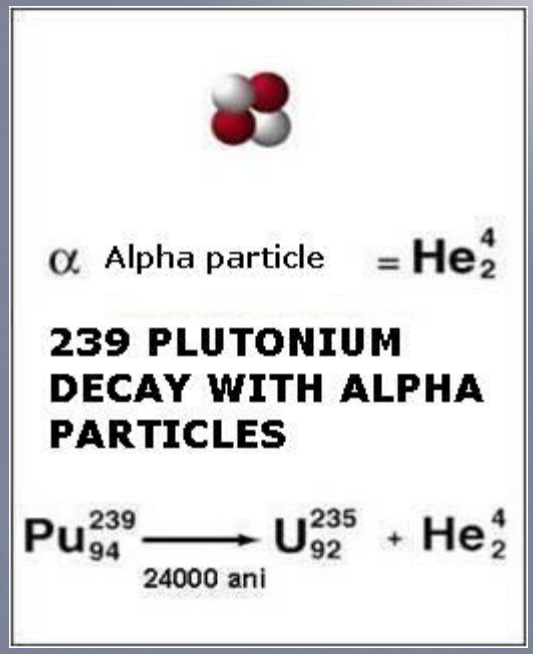
PLUTONIUM

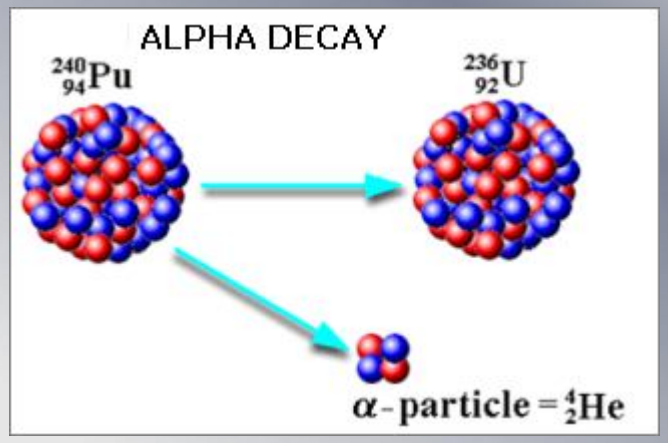
It is a radioactive chemical element, emits alpha radiations.

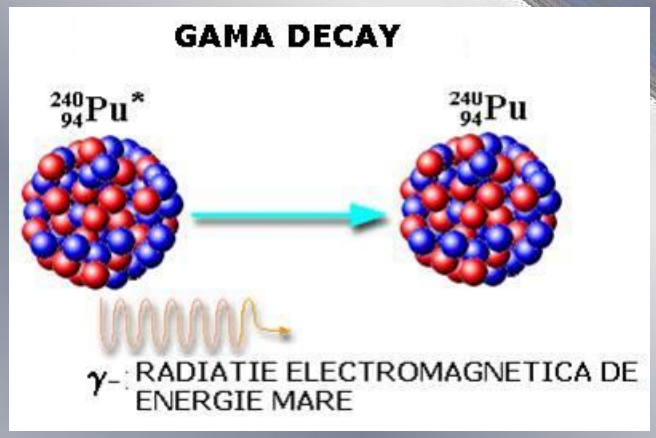
• Plutonium toxicity is high, being slightly higher than that of mercury. Plutonium 239 is used in the manufacture of atomic bombs and in nuclear reactors for nuclear fuel.

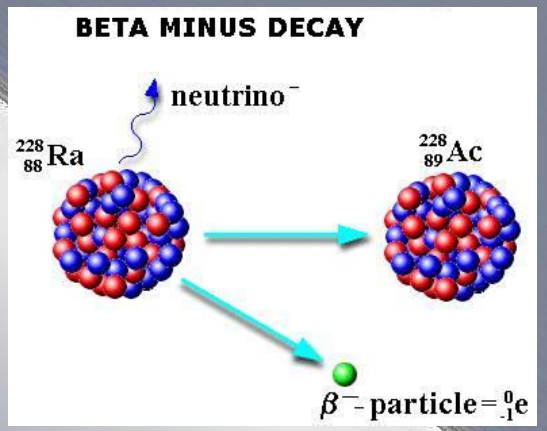
It is obtained by neutron irradiation of ^{238}U and therefore appears in the fuel of nuclear reactors with natural or slightly enriched uranium.

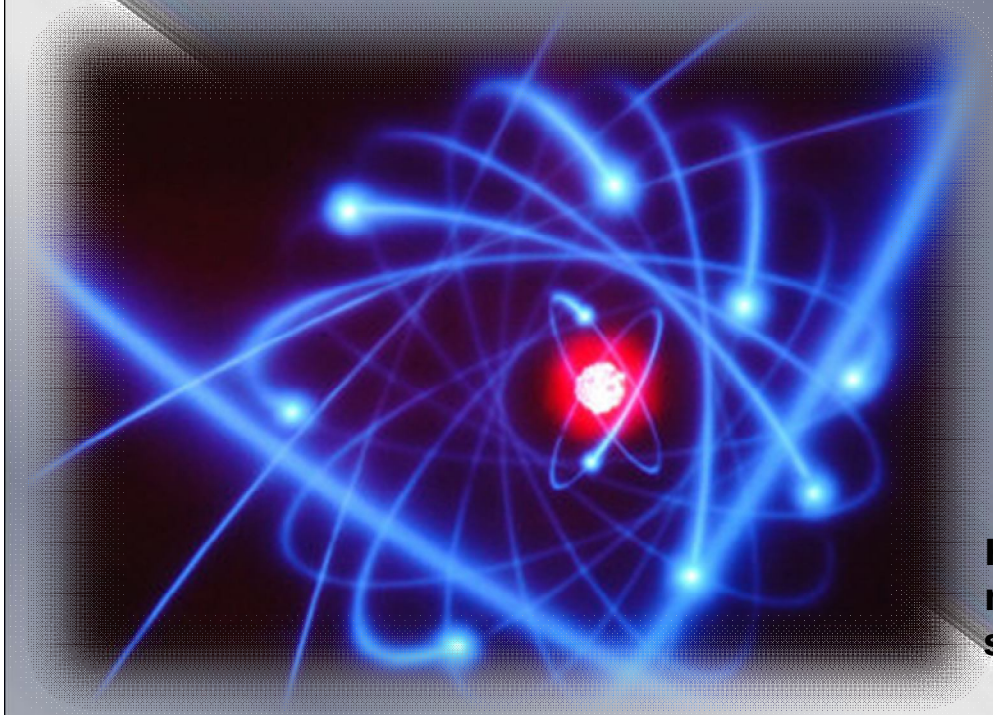
•Plutonium is also used in nuclear reactors, being associated and mixed with uranium oxide.











RADIOACTIVE NUCLIDES - HALF LIFE

$$T_{\frac{1}{2}} = \frac{\ln 2}{\lambda}$$

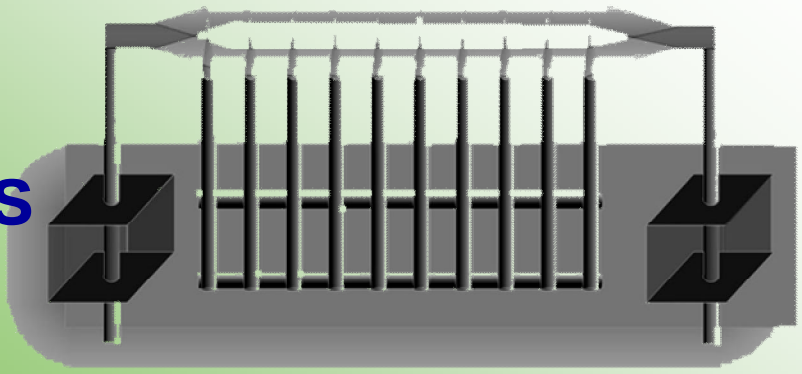
HALF LIFE T1/2 - time after that half of nuclides are decay in the metastable state.

NUCLID (RADIOACTIVE IZOTOP)	HALF LIFE T1/2
Uranium – ^{238}U	4,47 billion years
Plutonium – ^{239}Pu	24 400 years
Carbon – ^{14}C	5680 years
Americiu – ^{241}Am	458 years
Cobalt – ^{60}Co	5,3 years
Iodine – ^{125}I	60 years
Iodine – ^{123}I	13,3 hours
Radon – ^{222}Ra	3,8 days
Polonium – ^{214}Po	0,00016 seconds


WHY PANCUANTIC TECHNOLOGY?
Create an antiseptic, pure and healthy environment
Efficiency for all pollutants categories .
Indoors and open space usage.
Energy efficiency.
Can be used as ozone generator.
Doesn't use filters and supplies generating secondary waste.
Can be applied at the air pollution source.
Doesn't generate noise.

PANCUANTIC EQUIPMENTS

- ELECTRO-KINETIC CONVERTER -

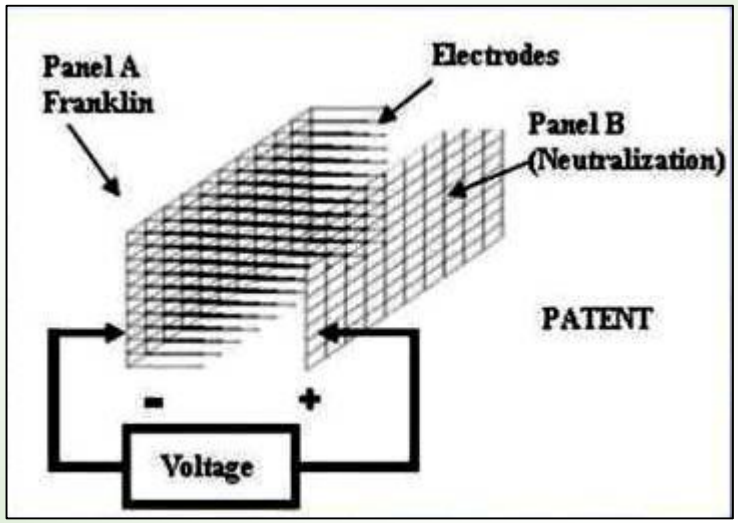


Pancuantic converters use cold plasma to control the energy needed for breaking the hetero-atomic chemical bonds in the pollutant molecules, with the production of an "atomic-ion soup“. After exiting the plasma field, they are recombined into non-pollutant homo-atomic molecules.

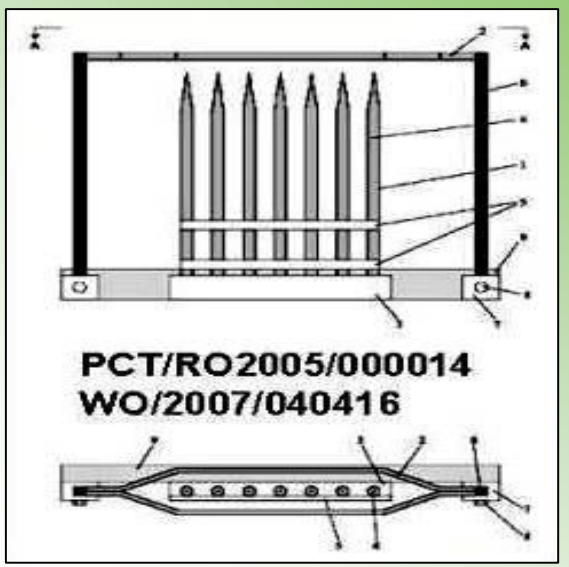
So, the CO_2, SO_2, NO, CO, CH_4, C_6H_6 gas pollutants and other organic compounds are decomposed under the influence of the plasmatic ion field and the ions are neutralized by forming non-pollutant compounds: O_2, O_3, N_2, H_2O_{vap}, carbon and sulfur powders that are collected in the tray device.

Also, the solid powders, the metal compounds (heavy and radioactive metal), microbial and macromolecular organic compounds also undergo suffer the plasma oxidative decomposition followed by ion neutralization and gravitational deposition in the tray device of particles heavier than air (C, Si, S) concomitantly with non-pollutant gas releasing (O_2, O_3, N_2, H_2O_{vap}).

ELECTRO-KINETIC CONVERTER– COMPONENTS



VERSION 2001



VERSION 2005

http://www.wipo.int/pctdb/en/

ELECTRO-KINETIC CONVERTER CONTAINS THE FOLLOWING COMPONENTS:

PANEL A - FRANKLIN – fitted with sharp metal rods at the top (for electron injection), perpendicularly welded to the panel, in the points of intersection of the grid wires.

PANEL B – NEUTRALIZATION PANEL– which has the role of orienting and enhancing the electric field strength.

COLD PLASMA

Cold plasma is produced by electrical discharges in a gas or by radio-frequency electromagnetic field excitation.
The present technique involves the cold plasma production at atmospheric pressure using the short and repetitive high voltage pulses (tens, hundreds of pulses per second at tens of kV).
The electrical pulses are applied between metal electrodes (metal peak) and perforated plate located at the opposite end, acting as a dielectric barrier (air).
Practically, there is an electric discharge in a gas space, which electro-kinetically drives a gas flow at atmospheric pressure.
In optimal conditions, plasma is emitted in the small jets, of millimetres in length, but with less than one millimetre diameter.
As the discharge plasma is spatially separated from the ion neutralization area and the high voltage pulse generator electrical charge is almost constant, there is the technical adaptation for the maximum possible energy transfer.

PLASMA PRODUCTION
- TIP EFECT -

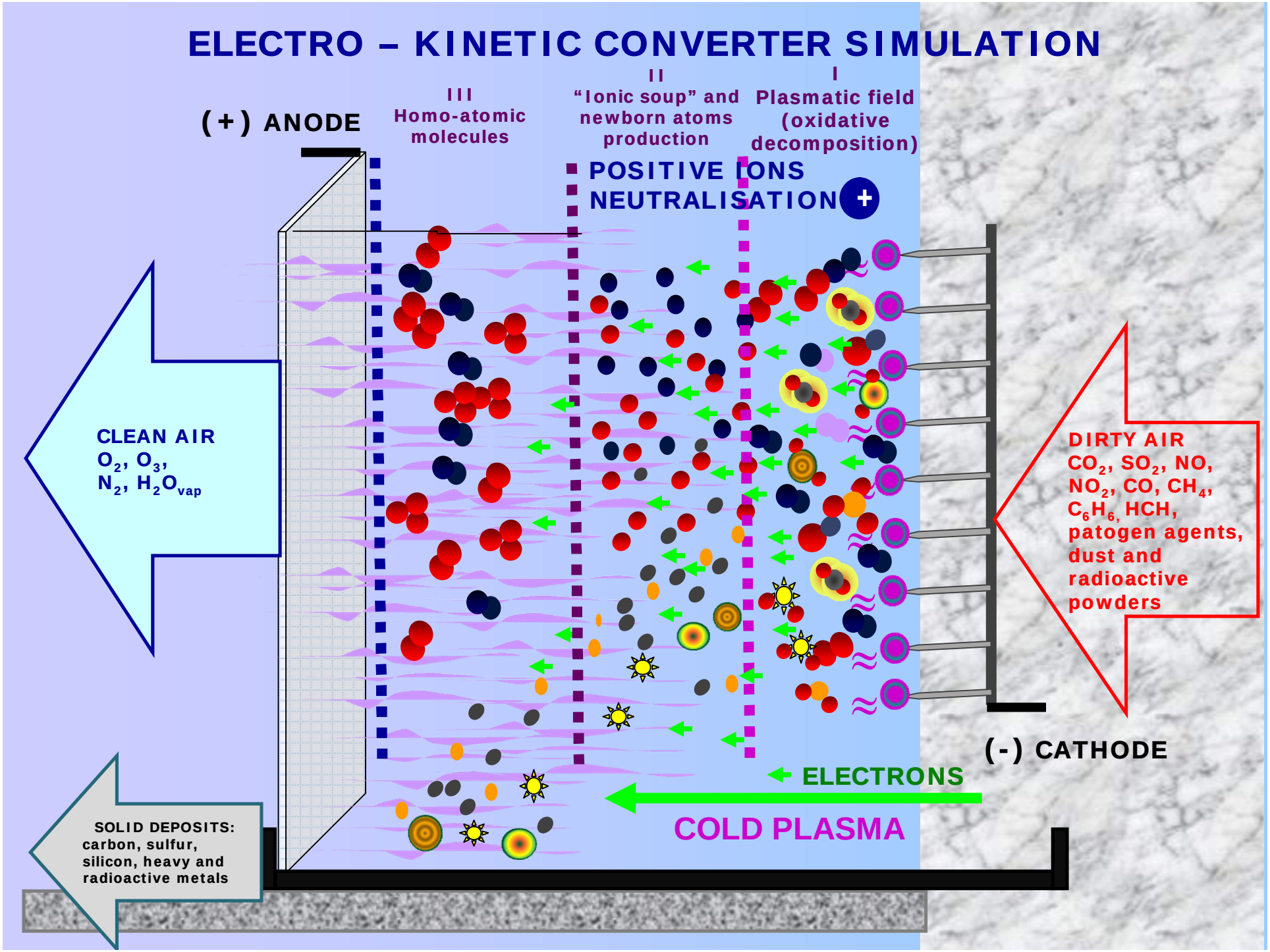
PANCUANTIC TECHNOLOGY

PANCUANTIC TECHNOLOGY uses the structured electrical field peak effect as a generating phenomenon for the energetic conditions needed for the oxidative decomposition of pollutants.

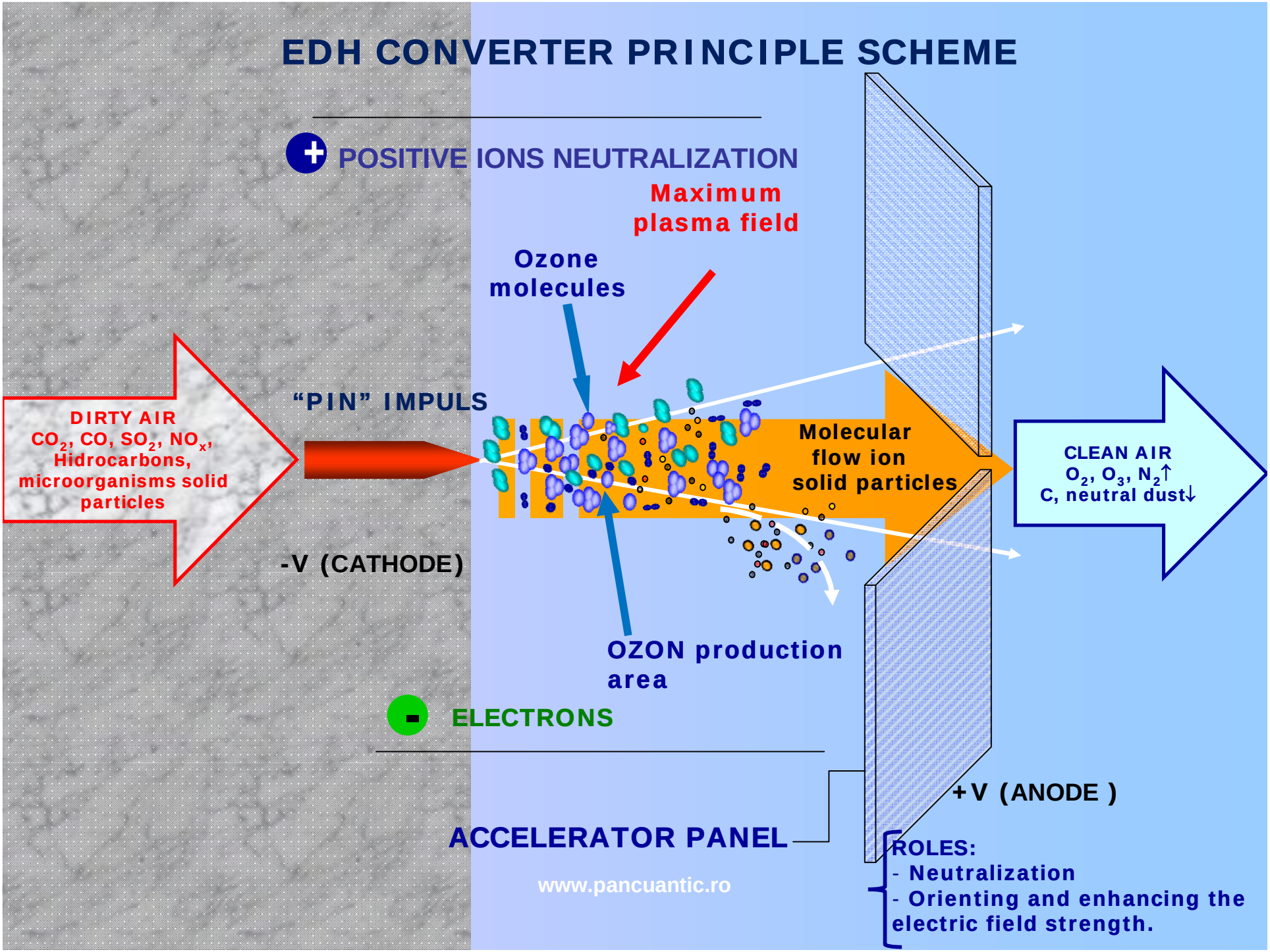
The phenomenon is accompanied by an electron flow injection through the metal peak to the positively polarized armature (anode).

As a result, immediately near the peak, a high-intensity pulsed electric field appears and generates the highly energized areas where the cold plasma is produced.

In the area of the cold plasma, chemical bond breakages occur between the hetero-atomic molecules (CO_2, SO_2, NO, CO, CH_4, C_6H_6, dust) and homo-atomic molecules (O_2), and creating an “ionic soup” with high kinetic effect that causes the migration of the positive ions to the cathode where reduction occurs in newborn atoms state. The newborn atoms recombine to homo-atomic molecules that are non-polluting (PCT/RO2005/000014 – 04.10.2005).


ELECTRO – KINETIC CONVERTER SIMULATION
III
Homo-atomic molecules
II
"Ionic soup" and newborn atoms production
I
Plasmatic field (oxidative decomposition)
(+) ANODE
POSITIVE IONS NEUTRALISATION
+
CLEAN AIR
O_2, O_3,
N_2, H_2O_{vap}
DIRTY AIR
CO_2, SO_2, NO, NO_2, CO, CH_4, C_6H_6, HCH, patogen agents, dust and radioactive powders
(-) CATHODE
ELECTRONS
COLD PLASMA
SOLID DEPOSITS:
carbon, sulfur, silicon, heavy and radioactive metals

EDH CONVERTER PRINCIPLE SCHEME



ELECTRO – KINETIC CONVERTER APPLICATIONS

- **Household and public utilities:** fan, air purifier, the noise attenuator, exhaust fumes de-polluting , industrial and urban de-polluted, cooler, radiator, hoods, compressors, refrigerators, etc.
- **Electro-kinetic Convertors:** active VELA, active wing lift, aerodynamic tunnel, bearing intensifier, portable, air compressor, aerodynamic modulator (cyclotron)
- **Electro-acoustic converters:** high-fidelity speaker, aerodynamic modulator (cyclotron), very low frequency transducer, very low frequency transducer, ultrasound frequency transducer, ultrasound generator, generating silence or harmonics, etc.
- **Transport:** anti-fog system, radiator cooler, noise damper, air conditioning cooling, air filtration before the engine inlet;
- **Environment:** ozone generator, ion generator, ozone neutralizer, air sterilizer, air purifier;
- **Power:** without propellers wind power generators, electrostatic energy recovery, ultra-high voltage and high power rectifiers, heat recovery, high-capacity cooling systems, etc.;
- **Medicine:** air sterilizers and sterilizing the instruments, ozone therapy and allergen neutralizer;
- **Other applications:** the basic research field, communication with other terrestrial species, the military, meteorology, fog screens, etc.

ELECTRO-KINETIC TECHNICAL FEATURE

- **Max. 0.06 W power consumption for 1 m³ of gas processed;**
- **Does not produce noise;**
- **The molecules or carbon dioxide destroying and releasing oxygen;**
- **The air processed microorganism destroying (viruses, microbial, etc.), fungus and insects in the processed air, eliminates air smoke and odor eliminating;**
- **It can also function as a heat pump;**
- **Franklin overall yield is 0,9;**
- **You can build any size surface;**
- **equipment can work series, parallel, cyclone or constant linear;**
- **Except energy source lifetime is virtually unlimited;**

E-mail: informatii@pancuantic.ro
pancuantic@pancuantic.ro
Phone: (+40) 723 68 44 30

www.pancuantic.ro

Presentation by:
CRISTINA VÎIU
e-mail: cristinaviiu@msn.com
Phone: (+40) 725 56 17 13