STAGE IV: 15.05.2009

Partial realization of the experimental model for flue gases treatment with electron beam (EB) and microwave (MW) for the industrial accelerator

Activity IV.1 Partial realization of the combined irradiation reactor
Activity IV.2 Partial realization of the experimental model for the gases preparation for the industrial accelerator
Activity IV.3 Participation to scientific manifestations and dissemination of the results

In phase III was developed, designed and began realization of an acid gases conversion model by simultaneous treatment of electron beams + microwave for an industrial accelerator and during phase IV was continued the realization of this model.

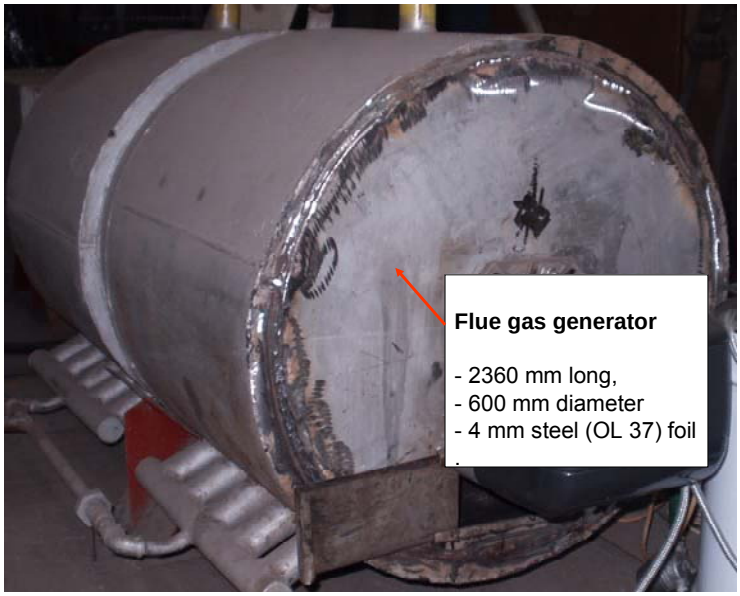
During this phase continued achievement of the combined radiation reactor. This reactor was designed for irradiation of toxic gases, according to the requirements imposed by the multiple functions that must be fulfilled by an irradiation chamber as electromagnetic multimode cavity. The reactor is rectangular with the inner dimensions 6λ x 9λ x 2λ, where λ is the wavelength corresponding to frequency of 2.45 GHz, provided on top cover with a thin aluminum window of 40 μm with surface of 6 cm x 100 cm, wherethrough enter the electron beam from the industrial accelerator. Microwave flow is introduced by 6 slits cut in the upper horizontal wall of the reactor, through six generators adapted from microwave ovens.

The microwave injection system consist of 6 microwave generators of 2.45 GHz magnetrons and their filament transformers, which provides microwave field inside the rectangular multimode cavity (reaction chamber).
The power and control magnetrons system which is positioned outside the irradiation chamber will contain 3 control modules, each module containing two magnetron control systems. During this phase was made one of the 3 power and control modules.

The experimental model for the gases preparation for the industrial accelerator was partially developed during this phase and must produce a similar gas flow with real flue gases, whose composition, temperature and kinetics can be rigorously controlled. The experimental model should allow gas flow to be conditioned, ie to provide the physical-chemical properties imposed by fundamental principles of non-thermal plasma de-NOx de-SOx method. The experimental model consists of: flue gases generator, water conditioning system, gas cooler, coarse filter, flue gas fan.

MU injection systems positioning on the reaction chamber, in execution stage

One of the 3 power and control modules for two magnetrons, in various stages of execution



Combustion gas generator –frontal view