

SEMINARIO REGIONAL SOBRE APLICACIONES AMBIENTALES DE LOS ISOTOPOS Y RADIACIONES PARA PAISES DE AMERICA LATINA Y EL CARIBE

SANTIAGO DE CHILE
9 - 13 DE AGOSTO DE 1993

TRATAMIENTO DE GASES DE COMBUSTION DE CARBON, MEDIANTE IRRADIACION CON ACELERADORES DE ELECTRONES

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Abstract

The air pollution caused by combustion flue gases from industrial plants has become a serious problem nowadays. The emissions and the reactions of SO_2 and NO_x in the atmosphere are the most responsible for environmental pollution and the cause of "acid rain".

Specially in relation to the electrical power generating sector, the exhaustion of the competitive hydroelectric power potential in Brazil during the decade 2011/2020 will demand a program for the development of the national technology capacitation in thermoelectrical power plants.

Until the end of this century, the participation of thermoelectric power in the national power balance will be increased in the ratio compatible with the country's natural resources.

In such case, the development of efficient flue gas removal techniques (mainly SO_2 and NO_x), will be necessary once Brazil has already started to set up limits for such pollutants (CONAMA resolution 06/12/91).

The removal of SO_2 and NO_x by electron beam irradiation from simulated coal-fired flue gas will be studied using a small scale flow system which is being set up in order to obtain basic data for the process technical and economical feasibility concerning industrial applications.

The gas irradiation will be performed using an electron beam accelerator with 1.5MeV power, 25mA current from the Radiation Dynamics Inc., USA. The irradiation system was projected in order to investigate single, double and triple irradiation processes.

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DETERMINACION DE RECAMBIO DE AGUAS SUBTERRANEAS EN ABADIA DE GOIAS, ESTADO DE GOIANA, POR APLICACION DEL METODO DE TRITIO MARCADO ARTIFICIALMENTE.

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Abstract

The movement of the moisture in the unsaturated zone can be monitored using both environmental and artificial tritium. Artificial tritiated water was used as a tracer for determining the groundwater recharge in the radioactive waste disposal site at Abadia de Goiás-Goiania. Groundwater recharge is the input rain into the saturated zone and is essential for urban water supply, agriculture and resource evaluation.

The region studied is located in the central part of Brazil. The area is covered by lateritic soil. The climate is semi-arid tropical with mean temperature of 23.2°C, mean annual humidity of 66% and mean annual precipitation of 1520 mm. Almost all of the total rain precipitation, 75%, is concentrated between november to march. The driest time is from june to august with precipitations corresponding to 2% of the total amount.

Injections of tritiated water were made in july 1991 at depth of 50 cm below the surface out of the root zone of vegetation. Five points injections were made at 10 cm radial distance in the form of a cross. In each point was injected 2.5 ml of tritiated water with concentration of 5.55×10^4 Bq/ml. Soil samples were taken with hand auger after four, nine and twelve months from injection. For extraction of moisture, the soil samples were distilled in a vacuum system and the estimation of tritium was carried out by liquid scintillation counting. The recharge was calculated from tritium and moisture profiles.

The results have shown a good correspondence bewteen the soil the groundwater recharge. The highest recharge obtained was 30.07 cm and the lowest one was 11.63 cm. The mean value for the recharge was 21.32 cm, corresponding to 14.36% of the precipitation in the period of july 1991 to july 1992. It was obtained a value of 30% for the tracer recover that is considered good for this kind of work