

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

IPEN-DOC-
5308

SANTIAGO DE CHILE
9 - 13 DE AGOSTO DE 1993

DESINFECCION DE AGUAS SERVIDAS POR MEDIO DE
IRRADIACION UTILIZANDO ACELERADORES DE ELECTRONES

S. Borrely, M. De Oliveira Sampa

Instituto de Pesquisas Energéticas e Nucleares, IPEN-CNEN/SP, Brasil.

Abstract

As a result of fast urbanization, problems with pollution have grown to unexpected levels compromising air, water, soil and living organisms. Water has become increasingly scarce day after day partially due to the different contaminants reaching it.

Chlorination as a disinfectant method is not efficient enough for sewage and its use can generate organochloride compounds with values higher than the maximum permissible. Besides, chlorination is recommended for cleaned water only. These are some of the reasons to justify the application of new technologies.

This paper considers the effect of ionizing radiation as a disinfectant method to be applied on sanitary field. An electron beam accelerator, Dynamitron, 1,5 MeV, 25 mA was utilized in this study.

Considering that wastewater microorganism contamination includes an indigenous population of human enteric pathogens and some of them are radioresistant *Bacillus* species, the use of very low doses of radiation to inactivate all of them is not possible. It was then supposed a minimum and ideal irradiation dose to kill 90% of all microorganisms that could be present in any sewage (D10). This value was 1,0 kGy.

The supposed ideal irradiation dose of 1,0 kGy was applied on samples from secondary effluent and on raw wastewater. In both situations this dose reduced total and fecal coliforms by 3 cycles log. After sample aeration, the irradiation efficiency was enhanced to 4 cycles log. The same dose was tested on *Salmonella derby*, *Salmonella typhimurium*, *Salmonella meleagridis* and *Salmonella infantis* added to phosphate buffer. In this case no colonies were formed, showing completely inactivation.

COLEÇÃO PTC

DEVOLVER AO BALCÃO DE EMPRÉSTIMO