



TR0700146

## Aspects of Degradability and Aging of Natural Rubber Latex Films Obtained by Induced Ionizing Radiation Processes of Latex Vulcanization

C. F. P. Martins<sup>1)</sup>, D.F. Parra<sup>1)</sup>, A. B. Lugão

<sup>1)</sup> Nuclear Energy Research Institute, IPEN, Av. Prof. Lineu Prestes, 2242; ZIP: 05508-900; Sao Paulo, Brazil; Phone: (+5511) 3816-9341.

*E-mail address of main author:* dfparra@ipen.br

This study refers to the degradability of NRLF, natural rubber latex films, obtained by ionizing radiation. Three types of NRLF were prepared: irradiated latex<sup>1</sup>, irradiated latex with about 1% of soy lecithin and sulfur-vulcanized latex, by cold vulcanization process. The films were buried in vases of two different kinds of soil: common soil and common soil with earthworm humus. Fast aging tests in laboratory with exposition to ultraviolet rays were done in irradiated latex films and irradiated latex films with soy lecithin. The results obtained after ten months of tests with buried films agree with the results of the fast aging tests, showing singularities of each type of soil and each kind of latex process. It also shows how weather inclemency can induce the films degradation process. The sulfur-vulcanized films were weakly degraded when buried. The films with lecithin and buried in vase with only common soil showed the biggest mass loss, but the films with lecithin buried in vases with common earthworm humus and soil increased their weigh and dimensions due to fungi formation. The irradiated latex films are more degradable then the sulfur-vulcanized films. The irradiated latex film, unlike the sulfur vulcanized film, showed high fungi colonization when buried. We conclude that the irradiated latex films are more easily biodegradable than the sulfur vulcanized latex films. The biodegradability increases with the addition of small amounts of soy lecithin (~1%).

The mechanical resistance of the buried films decreased related to the non-buried ones, proving that the outdoor aging in soil and the presence of fungi in the films can modify the mechanical properties of the irradiated latex owing to the biodegradation.

[1] D.F.Parra, C.F.P. Martins, H.D.C. Collantes, A.B.Lugão, NIMB, 236, (2005), 508.