

Development of a new material to encapsulate phosphorus-32 for use in brachytherapy

Lara El Hajj Teodoro¹, Cristhian Ferreira Talacimon², Wilmmmer Alexander Arcos Rosero², Maria Eduarda Zaganin Rigo², Priscila Santos Rodrigues², Thuany Correa Nogueira², Lucas Verdi Angelocci², Maria Elisa Chuery Martins Rostelato²

¹Instituto de Pesquisas Energéticas e Nucleares (CETER) , ²Instituto de Pesquisas Energéticas e Nucleares

e-mail: lara.el.hajj.teodoro1100@gmail.com

The term cancer refers to a set of malignant diseases that have in common the disordered growth of mutated cells, which can invade adjacent tissues or distant organs[1]. In 2020, cancer of the central nervous system (CNS) represented 1.6% of all new malignant tumor cases in the world, and about 2.5% of all new cancer deaths[2]. A promising radioactive source for use in intracavitary brachytherapy is phosphorus-32. This source has been prominent as a minimally invasive treatment for craniopharyngiomas and in the treatment of metastatic bone diseases in general[3]. To encapsulate phosphorus-32 and make it a viable radioactive source for use in medicine, some methods have emerged. In this work, we are developing a fabric soaked in industrial latex for this purpose, as this source comes in the form of orthophosphoric acid in aqueous solution and as industrial latex is soluble in water. Tests carried out so far show that the material supports orthophosphoric acid while is still malleable, which is essential for treating spinal cancer.

Acknowledgment to the agencies FAPESP 2017/50332-0, CNPQ 309061/2019-9, CAPES 88887.689556/2022-00 and AIEA BRA-6062, for project funding and scholarship