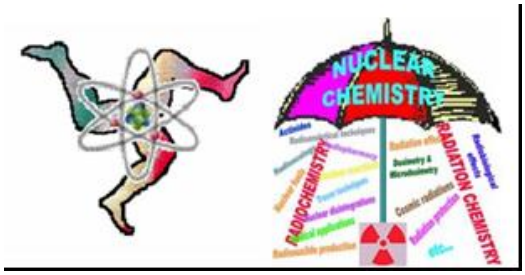

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Microspheres with an ultra high holmium content for brachytherapy of malignancies

Thursday 22 September 2011 17:30 (1h 30m)

The overall objective of this work is to develop biodegradable microspheres intended for internal radiation therapy which provides an improved treatment for hepatic carcinomas [1]. The most studied brachytherapy systems employing microspheres made of holmium-biopolymer system, is composed by poly(L-lactic acid) (PLLA) and holmium acetylacetonate (HoAcAc) [2]. The importance of the holmium high content in the microspheres can be interpreted as follows: a) From a therapeutic standpoint, for effective use of microspheres loaded with the complex, it requires a high content of holmium to yield enough amounts of radioactivity with a relatively low amount of microspheres; b) From the viewpoint of the microspheres irradiation, namely, small quantities of holmium-165 would require longer irradiation times to the polymers, which would be subjected to undesirable radiation doses of the reactor core [2, 3]. The usual amounts of holmium that are incorporated in the microspheres composed by poly(L-lactic acid) and HoAcAc are 17.0 ± 0.5% (w/w) of holmium, which corresponds to a loading of about 50% of HoAcAc [3]. Different approaches have been investigated to increase that value. One updated approach towards this direction, is the production of microspheres with ultrahigh holmium as matrix using HoAcAc crystals as the sole starting material without the use of biopolymer [4,5]. Likewise, in the process searching for the increase of the holmium content in the microspheres, it has been demonstrated that by changing the HoAcAc crystal structure by its recrystallization from crystal phase to the amorphous there is lost of acetylacetonate and water molecules causing the increasing of the homium content. Microspheres were prepared by solvent evaporation, using holmium acetylacetonate (HoAcAc) crystals as the sole ingredient (A). Microspheres were characterized by using light and scanning electron microscopy (B), infrared and Raman spectroscopy, differential scanning calorimetry, X-rays difration (C) and confocal laser scanning microscopy(CLSM).
References: [1] Renata F. Costa, Mariangela B. M. Azevedo, Nanci Nascimento, Frank F. Sene, José R. Martinelli, João A. Osso International Nuclear Atlantic Conference - INAC 2009, ABEN ISBN: 978-85-99141-03-8; [2] Nijsen J. F. W. et al. Eur. J. Nucl. Med., 26, 699-704, 1999; [3] Zielhuis S. W. et al. Intern. J. Pharma., 311, 69–74, 2006; [4] Bult, W. et. al. Pharma. Res. 27, 2205-2212, 2010; [5] Pharm. Res. 26, 1371-1378, 2009.

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