Boron chelate applied as a promising captor of neutrons

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Boron neutron capture therapy (BNCT) is binary treatments against cancer, known for generate small harmful effects on healthy cells[1]. This procedure is based on administering a compound that contains the isotope 10 of the element boron (^{10}B), followed by irradiation with thermal neutrons (~2KeV), with subsequent nuclear reaction of transfer and release of high linear energy of alpha particles and lithium. The nuclear reaction[2] can be showed by equation: $^{10}B + {}^{1}n \rightarrow \alpha + {}^{7}Li$. These formed products have short range, in this way basically acts on tumor cells, making this therapy, localized and selective[3]. Due to these characteristics, new boron chelates have been synthesized in the intention to produce new candidates for BNCT.

Boron Chelate (BC) was synthesized and characterized by nuclear magnetic resonance of ^{1}H and ^{13}C, MALDI -TOF and infrared spectroscopy. The BC synthesis was reproductively and with yield of 95%.

The neutron adsorption capacity was evaluated through of the irradiation process, by thermalized neutrons (Am-Be source), of a boron chelate solution. The ^{7}Li production by BC was monitored for ICP-OES (Table 1).

Table1. ^{7}Li amount present in sample, obtained by ICP-OES.

Li ($\mu g\ L^{-1}$)	SD (Standard deviation)	% of conversion $^{10}B \rightarrow {}^{7}Li$
31.0	2.0	98
11.8	0.5	97
0.9	0.1	98
6.7	0.2	99

The BC may be used in BNTC, since the nuclear reaction of $^{10}B \rightarrow {}^{7}Li$ was successfully achieved and with high yield in lithium production.

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