

BNCT RESEARCH FACILITY AT IEA-R1m REACTOR

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A BNCT (Boron Neutron Capture Therapy) research facility was constructed at IPEN-IEA-R1m reactor. From its conception up to its final configuration around a decade went by. Its final design changed along the way, either to attend more stringent safety criteria or as a consequence of money shortage and management.

The facility installed at beam-hole (BH) number 3 can be described to be consisted of 2 modules:
- an inner BH module: with the filter, sample and shielding arrangement sets and
- an out of wall module: with biological shielding room surrounding the sample positioning/removing table.

Neutron/gamma spectra can be modulated by a set of filters interposed between the reactor core and the sample position. As the sample irradiation region is inside BH, sample size is limited to a cylindrical enclosure of 30.0 cm height by 12.8 cm in diameter. Due to its size limit, the facility is not suited to carry any treatment. However neutron fluxes attained at the sample irradiation position is high enough to reproduce adequate conditions to perform experiments in Neutron Capture Therapy. The biological shielding at the end of the BH was designed and constructed to allow the extraction of the sample (and the inner shielding with it) even with the reactor on. This feature together with a remote controlling sample positioning/removing system enables controlling the sample exposition time (dose).

All these features together have provided irradiation conditions well fitted to perform experiments in research fields other than BNCT. Experiment such as:

- neutron radiation biological damage;
- neutron dosimetry and
- neutron detectors

have been carried out in this facility.

This work intends to present this facility to the Nuclear community, showing its characteristics, limits and potentialities in order to establish new working partnerships, which can profit from a forthcoming extended reactor operating program.