Canadian Nuclear Laboratories | Laboratoires Nucléaires Canadiens

Gammacell 220 Cobalt-60 Irradiator Facility

While there are other irradiation facilities around the world, the Gammacell 220 Cobalt-60 Irradiator Facility (Gammacell) located at CNL's Chalk River Laboratories is unique because it is situated in a radioisotope laboratory that includes a vented enclosure and a fume hood that that will accommodate radioactive samples. In particular, the laboratory staff is experienced in studies involving radioiodine. Studies on iodine chemistry began after the Three Mile Island Accident in 1979, when it became clear that more knowledge about iodine behaviour was needed.

Research on the behaviour of water, gas and solids in radiation fields has been needed since the beginning of the nuclear age. The Gammacell 220 Cobalt-60 Facility allows researchers to study radiation-related chemical processes that occur in nuclear power plants during normal operation and during postulated accident conditions. The radiation field within the gamma cell is used to simulate the radiation present within a reactor, or within the containment building after an accident. Experiments generally involve irradiating a specimen within an irradiation vessel. The specimen can be solid, liquid or gas, and is often multi-phased. Samples are removed at regular intervals to monitor the chemical and physical changes that take place as a function of absorbed dose.

Currently, a continuously flowing radiolysis test loop is being used to study a variety of CANDU® station problems that involve water radiolysis (e.g., hydrogen generation and corrosion). In addition to work with the CANDU Owners Group, the experienced staff have performed contract work for the Nuclear Energy Agency of the Organization for Economic Co-operation and Development (OECD), which is made up of member countries from throughout the world. The Gammacell 220 Cobalt-60 Irradiator Facility would welcome other partnerships.