



Van de Graaff Accelerator Facility

CNL's Van de Graaff Accelerator Facility has a unique combination in Canada of an electron accelerator, a one-of-a-kind target system, and an optical detection system that allows researchers the opportunity to study pulse radiolysis in liquids and gases at elevated temperatures and pressures. Currently, short pulses of high energy electrons, capable of depositing up to 50 Gy per pulse, are available for the examination of radiolytically generated highly reactive species.

The accelerator is able to produce a continuously variable electron beam in the range of 0.5 – 2.25 MeV. This electron beam has a peak beam current of approximately 2.5 A and pulse widths of 0.5, 1 and 2 μ s. The currently available repetitive pulse rates are 0.25, 0.5, 1, 2 and 5 pulses per seconds with a focused beam of less than 1 cm².

The beam line can be configured to accept a wide variety of target assemblies, and previously, liquids, solids and gases have been irradiated. Currently, the facility is set up for performing pulse radiolysis of liquids with simultaneous kinetic absorption spectroscopy. This target is housed in an autoclave that enables the study of liquid water at temperatures up to 300°C and pressures of up to 10.5 MPa. Changing target configuration can be accomplished in a few hours.

The Van de Graaff Accelerator Facility is operated by members of the Reactor Chemistry and Corrosion Branch (RCCB) at CNL's Chalk River Laboratories. In addition to the hands-on operation of the facility, RCCB professionals have an extensive knowledge of radiation chemistry, and are able to leverage existing expertise in this field to enhance any project.

CNL offers numerous complementary facilities to further any proposed partnership, including radiation protection, RCCB's surface science facility, three gamma cell Co-60 irradiators, and a full line of analytical services provided by the Analytical Chemistry Branch. We are also interested in working with groups looking to exploit the unique combination of equipment available for the development of new technologies.

The Van de Graaff Accelerator Facility welcomes research partners interested in studying the effects of ionizing radiation in condensed matter.

