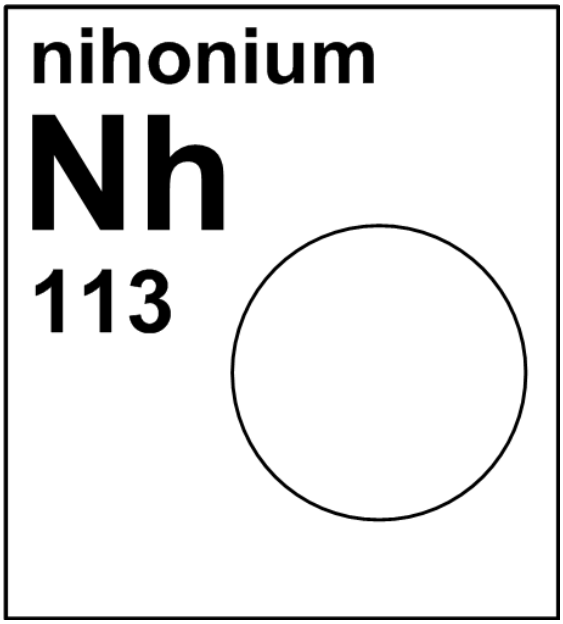
4.113 nihonium



Stable isotope	Relative atomic mass	Mole fraction
(none)		

Half-life of radioactive isotope

Less than 1 hour ☐

^{278}Nh	^{282}Nh	^{283}Nh	^{284}Nh	^{285}Nh	^{286}Nh

Nihonium does not occur naturally in the Earth's crust. The name nihonium and the symbol, Nh, are the accepted ones for **element** 113. Nihon is one of the two ways to say "Japan" in Japanese and literally means "the land of the Rising Sun." It is the first element to have been discovered in an Asian country. [662-664].

The synthesis of nihonium was first announced in 2004. The Joint Institute for Nuclear Research (JINR) and the Lawrence Livermore National Laboratory were able to produce two super-heavy elements by bombarding a rotating ^{243}Am disc with an ion beam of ^{48}Ca in a U-400 **cyclotron**. During the reaction, **isotopes** of moscovium, previously known as ununpentium, were synthesized and decayed in a tenth of a second to nihonium, which then decayed to roentgenium. Because the atoms of moscovium only existed for a tenth of a second, radiochemical proof was needed to support its syntheses. A Swiss scientist at the Paul Scherrer Institute (PSI) performed the radiochemical experiment by analyzing a copper plate that had been placed behind the ^{243}Am disc in the cyclotron. This copper plate collected all moscovium atoms that were synthesized and was processed through liquid chromatography techniques that yielded five times more moscovium atoms than produced by fusion alone. The direct synthesis of nihonium was announced later that year by a team of Japanese scientists from the Cyclotron Center of the RIKEN Research Institute. These scientists bombarded atoms of ^{209}Bi with a beam of ^{70}Zn in a RIKEN heavy-ion linear accelerator (RILAC), shown in Figure 4.113.1, and gas-filled recoil ion

separator (GARIS), shown in Figure 4.113.2. Nihonium has no known isotopic applications aside from scientific research.

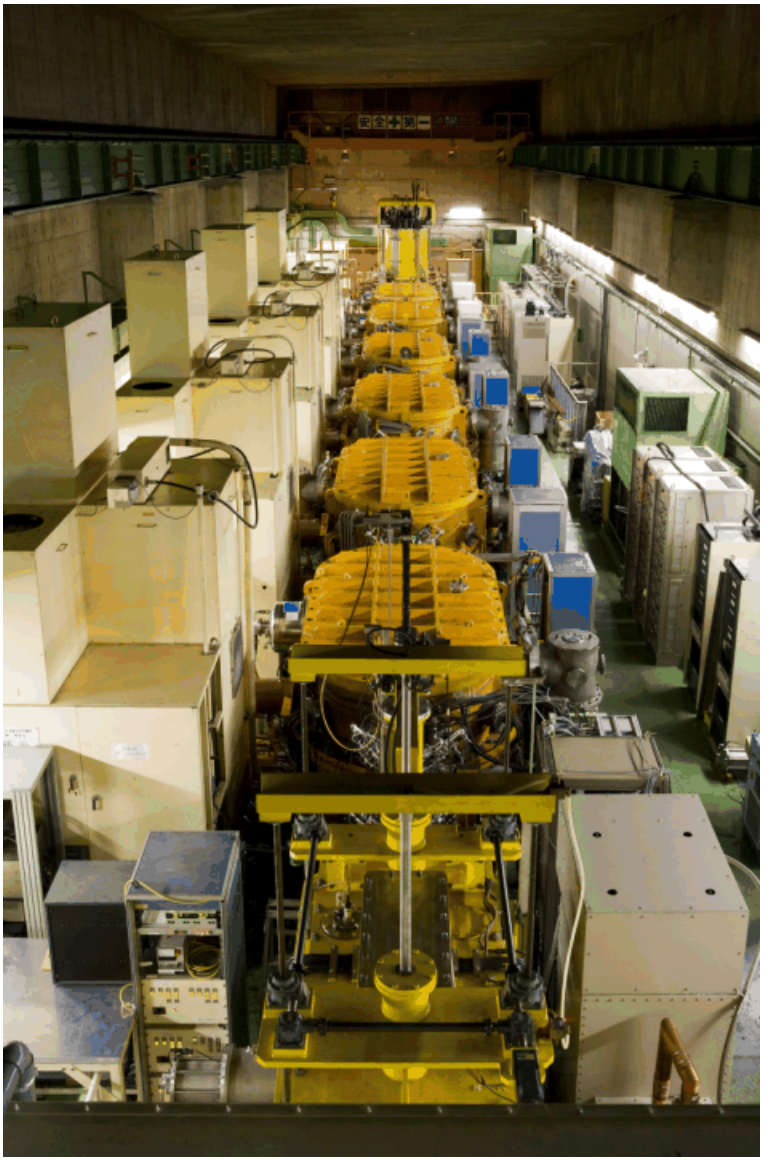


Fig. 4.113.1: RILAC (RIKEN linear accelerator) used to synthesize nihonium (kindly provided by RIKEN).

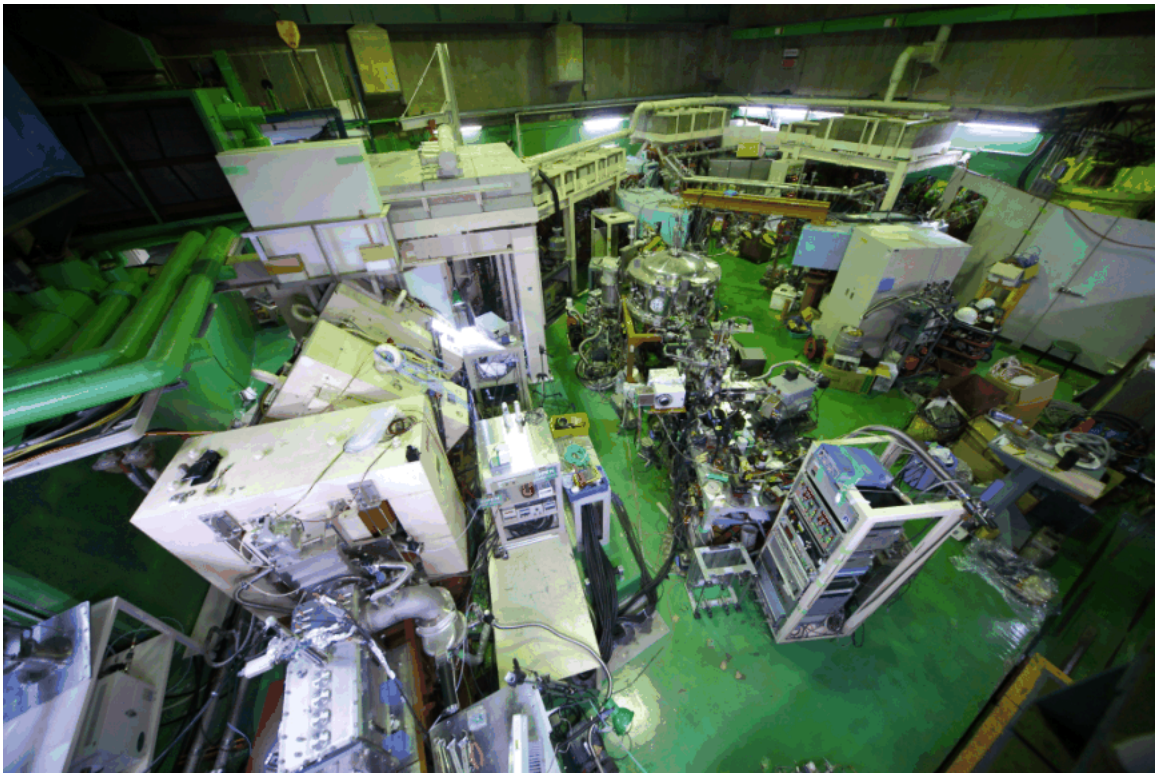


Fig. 4.113.2: GARIS (Gas filled recoil ion separator) used to synthesize nihonium (kindly provided by RIKEN).