



LINDA ABLITT

NIHONIUM

Element Symbol: **Nh**

Atomic Number: **113**

*In celebration of
The International Year of the
Periodic Table of Chemical Elements*



raci.org.au

NIHONIUM

Like many of its fellows in the seventh period, nihonium cannot be found in nature. Being extremely radioactive, the half-lives of its isotopes range from mere milliseconds to a handful of seconds. Calculations predict that its properties should be similar to other group 13 post-transition metals, which are soft or brittle metals with covalent character in their bonding and the prevalent oxidation states +3 and +1. However, the additional electronic orbitals of nihonium are expected to have a significant impact on its chemistry, and since very few atoms of the short-lived element have ever been made, most of its properties remain a mystery.

The discovery of element 113, designated ununtrium, was reported both by the RIKEN Nishina Center for Accelerator-Based Science in Japan (2004) and the Russian-American researchers of the Joint Institute of Nuclear Research in Russia (2003). Because one observation does not an elemental discovery make, it wasn't until 2015 that the priority for this discovery was assigned to RIKEN.

As with many of the superheavy elements, nihonium's existence was proven by observing radioactive decay pathways. The Morita research group at RIKEN bombarded a thin layer of bismuth with zinc ions travelling at 10% of the speed of light, hoping to cause the atoms to fuse. The resulting heavy, unstable atoms would then immediately begin to radioactively decay. Exploring the territory of lab-made elements is slow work: between 2004 and 2012, the group observed only three successful "events" of element 113. However, with additional experiments to solidify their understanding of the decay pathways, these three experiments (once corroborated by other researchers) were enough to prove the group's claim to the discovery of element 113.

The first element discovered in Asia, element 113 was also the first to be synthesised in Japan. Confirmed discovery of an element convey to the discoverers the naming rights (following set conventions, of course), and so, in late 2016, nihonium was officially added to the periodic table.

Provided by Anna Ahveninen, RACI Communications Officer

Resources

http://www.riken.jp/en/pr/press/2015/20151231_1/
<https://iupac.org/discovery-and-assignment-of-elements-with-atomic-numbers-113-115-117-and-118/>
<https://www.britannica.com/science/boron-group-element>

ARTIST'S DESCRIPTION

Nihon, meaning Japan, led to thoughts of the 'land of the rising sun'. I designed this woodcut to depict a red sun rising above the horizon.

LINDA ABLITT