



LINDA ABLITT

MOSCOVIUM

Element Symbol: **Mc**

Atomic Number: **115**

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



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MOSCOVIUM

Moscovium was first synthesised in 2003 by a Russian-American team of scientists through a collision of calcium-48 with americium-243. Like fellow laboratory-made superheavy elements, its short existence has been confirmed through analysis of its “fingerprint”: radioactive decay chains. In most superheavy elements, these chains involve both spontaneous fission (splitting of a nucleus) and alpha-decay (emission of an alpha particle). The nucleus of moscovium-288, the first isotope synthesised, has odd numbers of both protons and neutrons, giving it resistance to spontaneous fission. This resulted in a decay chain composed of successive alpha particle emissions up to dubnium-268, where spontaneous fission took over.

As one of the most recent additions to the periodic table, moscovium received its name and symbol in 2016 together with nihonium, tennessine and oganesson. According to the International Union of Pure and Applied Chemistry, rather than being named for the city, the name of element 115 instead honours Moscovia, “the ancient Russian land that is the home of the Joint Institute for Nuclear Research, where the discovery experiments were conducted.”

Moscovium belongs to group 15, the pnictogens. Like most groups in the p-block, group 15 consists of a mixture of non-metals, metalloids and metals, with metallic character increasing down the group. Because superheavy elements are produced only atoms at a time, and because the longest-lived isotope of moscovium has a half-life of mere milliseconds, very little is certain about its physical or chemical properties. Despite their relationships due to electronic structure, the chemistry of superheavy elements is generally expected to vary from their lighter group members due to relativistic effects – that is, because the electrons of superheavy elements move much faster than those of lighter elements, approaching the speed of light.

With a calculated melting point of around 400 °C, moscovium is expected to be solid at room temperature. Likely preferring the +3 and +1 oxidation states over the +5 common to most other elements in group 15, it may have chemistry in common with its neighbour bismuth, but also thallium-like character.

Provided by Anna Ahveninen, RACI Communications Officer

Although added to the periodic table in May 2012, flerovium, with its elusive magic isotope, still represents a frontier to be conquered by elemental explorers.

Resources

<https://iupac.org/iupac-is-naming-the-four-new-elements-nihonium-moscovium-tennessine-and-oganesson/>
[http://www1.jinr.ru/Preprints/2003/178\(E7-2003-178\).pdf](http://www1.jinr.ru/Preprints/2003/178(E7-2003-178).pdf)
<https://www.nature.com/articles/s41557-018-0185-6>

ARTIST'S DESCRIPTION

Having been discovered in Moscow, my thoughts were directed to the city skyline, and St Basil's Cathedral in particular. This is a woodcut of the cathedral printed in black and white.

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