Niobium-Titanium Alloy Demonstrates Its Strong Market Potential in the Fabrication of Fuel Cells

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MONTRÉAL, Sept. 19, 2024 - Niobay Metals Inc. ("NioBay" or the "Company") (TSX-V: NBY) (OTCQB: NBYCF) is proud to announce the first results of the work it is involved in with the Université du Québec à Trois-Rivières (UQTR) and the University of Waterloo on the valorization of critical and strategic metals encountered in NioBay's projects.

Work
Metallic bipolar plates are crucial for the development of compact and lightweight proton exchange membrane fuel cell sacks; however, most of them encounter durability and conductivity challenges in the fuel cell environment. In this study, Nb-Ti alloy/Pt coatings are deposited on SS316L plates to enhance corrosion resistance, surface wettability, electrical and thermal conductivity, with reduced interfacial contact resistance.

The work was directed by Professors Samaneh Shahgalidi of UQTR and Xianguo Li of the University of Waterloo, and carried out as part of Mr. Pramoth Varsan Madhavan's doctoral thesis.

Results
Amongst other results, the incorporation of Nb-Ti alloy/Pt coatings on SS316L increases the in-plane electrical conductivity by 42.6 % and thermal conductivity by 3.5 %, surpassing the US Department of Energy's technical targets in these categories. These results indicate the viability of Nb-Ti alloy/Pt coated SS316L bipolar plates for fuel cell applications.

The work was published in the journal: "Energy Conversion and Management 311 (2024) 118536". The full article can be found on the NioBay website under R&D project.

Extracted from the Journal: Fig. 9. (a) In-plane electrical conductivity and (b) thermal conductivity of the uncoated and Nb-Ti alloy/Pt coated SS316L samples.

Message from NioBay's President and CEO
"We are very pleased to announce the start of a series of results resulting from the collaboration of two leading universities in the field of hydrogen research. This work opens new markets for niobium and titanium," concludes Jean-Sébastien David.

Qualified Person
This press release has been reviewed and approved by Jean-Sébastien David, P.Geo., a qualified person under National Instrument 43-101. Mr. David is President and CEO of NioBay.

About NioBay Metals Inc.
NioBay aims to become a leader in the development of mine(s) with low carbon consumption and responsible water and wildlife management practices while prioritizing the environment, social responsibility, good governance, and the inclusion of all stakeholders. Our top priority, which is critical to our success, is the consent and full participation of the Indigenous communities in whose territories and/or on ancestral lands we operate.

In addition to others properties, NioBay holds a 100% interest in the James Bay Niobium Project located 45 km south of Moosonee, in the Moose Cree Traditional Territory of the James Bay Lowlands in Ontario. NioBay also holds a 72.5% interest in the Crevier Niobium and Tantalum project located in Québec and on the Nitassinan territory of the Pekuakaminulnuatsh First Nation. The Company has also the option to acquire a 80% interest in the Foothills project, a titanium-phosphate project located near the former St-Urbain mine site in Québec.

About Niobium
Niobium is a naturally occurring element. It is a metal that is ductile, malleable and highly resistant to corrosion. Because it enhances properties and functionalities, niobium is used in a wide range of materials and applications in the Mobility, Structural and Energy sectors. Niobium transforms materials. When added to materials like steel, glass and aluminum castings, niobium makes them more efficient and lowers environmental impacts, while also increased value.

About Titanium
Titanium (Ti) is as strong as steel, but much less dense. It is therefore important as an alloying agent with many metals, including aluminum, molybdenum and iron. These alloys are mainly used in aircraft and spacecraft because of their low density and ability to withstand extreme temperatures. They are also used in sports equipment, laptops, bicycles and medical prostheses. Recently, this metal has been used in some battery components.

About Hydrogen
Hydrogen is one of the most efficient energy carriers and can be produced by different methods. Among all the production methods, the proton exchange membrane water electrolyzer (PEMWE) is considered the most promising technique to produce highly pure hydrogen from renewable energy sources with pure oxygen as by-products with no carbon emissions.

About PEMWE technology
The PEMWE technology has reached the early stages of commercial deployment while the mass production is tied to cost reduction. The single electrochemical cell includes a membrane electrode assembly (MEA), porous transport layers (PTLs), and bipolar plates (BPPs). The PTLs cover the MEA on both sides and play an important role in cell performance, and durability as they are responsible for electrical and heat conduction in the cell as well as mass transport and accessibility of the reactants. In addition, they provide mechanical support to the delicate catalyst layers in MEA.

Neither the TSX Venture Exchange nor its Regulation Services Provider (as that term is defined in the policies of the TSX Venture Exchange) accept responsibility for the adequacy or accuracy of this release.

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