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Global Scandium Market Outlook to 2027

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Abstracts

Scandium is a silvery-white metallic element established in coalition with rare earth elements, get from extracted as a by-product from uranium mill tailings and it has a high-rise melting point, and low density like aluminum, and its small ion size enables it to react chemically with elements such as magnesium, zirconium, and aluminum. According to BlueQuark Research & Consulting, the global scandium market is expected to witness growth at a significant rate during the forecasted period. Factors like increasing demand for the usage of solid oxide fuel cells (SOFCs), driving the market's growth in the forecasted period. Further, rising demand for aluminum-scandium alloys used in the aerospace and defense segment is expected to propel the scandium market in the forecasted period. Furthermore, the need has been escalated by the rising utilization of SOFC-based fuel cells in the transportation sector are anticipated the scandium market growth. However, the high cost of scandium, inconsistent supply, and lack of knowledge would restrain this market's growth.

Scandium is used in lamps used in film and photography, and scandium iodide is used as it helps in generating light that is similar in tone to sunlight. It is also used in metal-halide lamps due to their higher efficiency, and it is increasingly being used instead of mercury-vapor lights.

A solid oxides fuel cell (SOFC) is an electrochemical transformation device that helps produce electricity directly by merging an oxidant and a fuel across an ionic conducting oxide electrolyte. SOFCs utilized a solid oxide material as an electrolyte, which helps conduct negative oxygen ions from the cathode to the anode. Anode and cathode are made from unique inks that cover the electrolyte in these cells. Therefore, SOFCs do not require precious metal, corrosive acids, or molten material. Electrolyte materials are subjected to excessive temperatures to catalyze natural gas conversion to energy in these cells. The high temperature for the catalyzing changing process can quickly degrade ceramic electrolytes, increasing capital and maintenance costs. Therefore,

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scandium in solid electrolytes helps the system operate at much lower temperatures than conventional SOFCs. Thus, the application of scandium has helped lower the costs of SOFCs, facilitating its widespread adoption for distributed power generation. With increasing electricity prices, the need to resort to sustainable power generation methods is expected to create substantial market opportunities for the SOFCs market, thus increasing the importance of scandium. Scandium containing SOFCs has commercially proved to offer outstanding performance compared to the conventional yttrium stabilized zirconia solid electrolytes. Due to this, the use of scandium-based electrolytes has helped increase ionic conductivity, cell efficiency, and the operating life of the fuel cells. At present, SOFCs are witnessing escalated application within transport, power generation, cooling, industrial equipment disaster relief, and regions where grid connections are not available. The surging demand for clean energy over environmental concerns of energy generation from conventional sources, like coal and natural gas, is projected to drive the demand for solid oxide fuel cells in the years to come. Consequently, such trends are projected to increase the scandium demand for applications in SOFCs significantly.

The global scandium market is consolidated. Major players in the market were found to be Scandium International Mining Corporation, Platina Resources Ltd, Clean Teq, Australian Mines Ltd, Hunan Rare Earth Metal Material Research Institute, Stanford Advanced Materials, among others.

The North-America region is anticipated to be the largest market for global scandium due to many end-user industries. However, the Asia-Pacific region will probably witness a faster growth rate than other areas. Defense and aerospace spending in this region is expected to play an essential role in driving APAC's market growth. One of the scandium's most important uses is the preparation of aluminum-scandium alloy, used in aircraft manufacture in the aerospace industry. Adding aluminum scandium helps to increase toughness, expand weldability, heat resistance, and weld strength to a variation of aluminum alloy materials. According to the aircraft manufacturer, approximately 0.1-0.5% trace amount of aluminum added scandium will help not only enhance aluminum capacity but also help to decrease aircraft weight by 15 percent. With surging security concerns and rising commercial use of aircraft as a means of transportation, global demand for aircraft has increased. Consequently, different aircraft production orders are planned for predicted delivery in the forecasted periods to provide orders from the aerospace and defense industries. Scandium assists the power generation system operate at much lower temperatures and reducing the cost of SOFCs, thereby facilitating its general adoption for distributed power generation globally. Apart from this, there is a growing need for a sustainable power generation

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method due to a significant increase in electricity prices. This, in turn, is undoubtedly influencing the sales of scandium around globally. It is worn as a substitute for yttria (Y2O3) as a stabilizing agent for the solid electrolyte in the fuel cell. This accredits reactions at lower temperatures, extending the components' life and increasing the unit's power density. This, along with the expanding adoption of aluminum-scandium alloys, positively influences the market. Additionally, the rising utilization of SOFC-based fuel cells as replacements for internal combustion engines in light-duty vehicles and warehouse forklifts to raise vehicle efficiency and support the goals of reducing oil usage and emissions from the transportation industry acts as another growth-inducing factor.

Australian Mines Ltd, one of the promising vital players in the scandium market, develops next-gen aluminum alloys in collaboration with Deakin University's Institute for Frontier Materials. The 9-month project that commenced on 12th October 2020 will use machine learning algorithms and Deakin's expertise in alloy development.

Rio Tinto Group, an Anglo-Australian multinational and the world's second-largest metals and mining corporation-have developed a new process to extract high purity scandium oxide, a critical mineral, from by-products generated in the production of titanium dioxide at the Rio Tinto Fer et Titane metallurgical operation in Sorel-Tracy in Quebec.

Global Scandium Market report provides deep insights into the current and future state of the scandium market across various regions. The study comprehensively analyzes the scandium market by segmenting based on type (Pure Metal and Metal Powders, Alloy, and Compounds), Application (Aerospace and Defense, Solid Oxide Fuel Cells, Sporting Goods, Heat Exchangers, and Others), and Geography (North America, Europe, Asia-Pacific, South America, and Middle-East and Africa). The report examines the market drivers and restraints, along with the impact of Covid-19 on market growth, in detail. The study covers & includes emerging market trends, developments, opportunities, and challenges in the industry. This report also covers extensively researched competitive landscape sections with profiles of prominent companies, including their market shares and projects.

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