Method and Materials for Achieving Corrosion Resistance

Track Code: 2016-SAND-67546

Categories:
- Chemical Engineering
- Materials and Manufacturing

Keywords:
- Alloys
- Chemical Engineering
- Corrision
- Materials and Manufacturing
- Metals

Among the numerous heat and mass transfer systems, there exists a need for corrosion-resistant materials for use in high temperature, high pressure, corrosive fluid environments. Such systems include, but are not limited to, electric power production, including solar energy-based power production, nuclear energy-based power production, fossil fuel-based power production; waste heat recovery; transportation/propulsion; and chemical processing. These systems require components suitable for use in high temperature, high-pressure environments, such as heat exchangers, piping, valves, pumps, engine components, etc. Unfortunately, embodiments of these corrosion resistant components lack in versatility and durability. More effective methods and materials are necessary.

A Purdue University researcher has identified solid and fluid materials capable of endowing metals, metallic alloys, ceramics, and ceramic composites with resistance to corrosion in high-temperature, high-pressure, corrosive fluid environments, where the fluid includes a gas, a liquid, or a supercritical fluid, or a mixture of these fluids. Materials have been developed to enable dramatically lower rates of oxidation, resulting in corrosion-resistant materials.

Advantages:
-Corrosion-resistant materials
-Enhanced use of high temperature and high pressure environments

Potential Applications:
-Systems for energy production, waste heat recovery, transportation/propulsion, and chemical processing

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Intellectual Property:

Application Date: April 17, 2019
Type: NATL-Patent
Country of Filing: United States
Patent Number: (None)
Issue Date: (None)

Application Date: October 11, 2017
Type: PCT-Patent
Country of Filing: WO
Patent Number: (None)
Issue Date: (None)

Application Date: October 18, 2016
Type: Provisional-Patent
Country of Filing: United States
Patent Number: (None)
Issue Date: (None)

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