

Multi-layer Coatings on Stainless Steel Study Appears on Hottest Articles List

Multi-technique approach provides popular information on materials for fuel cells

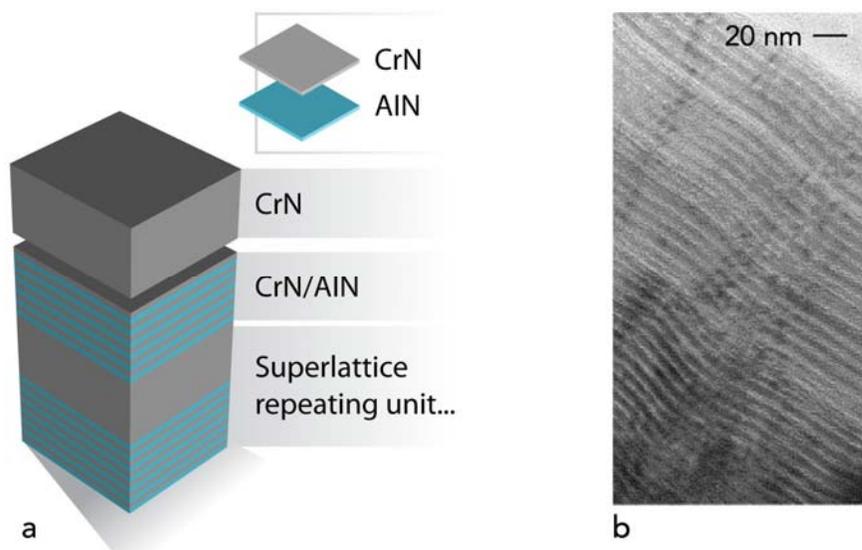
Congratulations to Paul Gannon, Cindy Tripp, Anders Knospe, CV Ramana, Max Deibert, Richard Smith, Vladimir Gorokhovskiy, Shuttha V. Shutthanandan, and David Gelles on having their article reach #1 on Elsevier's ScienceDirect list of the 25 hottest articles in physics and astronomy. The article is also #7 on the materials sciences list. ScienceDirect is a digital library with 8 million articles from 2,000 journals. The 25 most popular papers are selected based on the number of times the full text of the article is downloaded over a period of three months.

In the popular article, the scientists from Montana State University, Arcomac Surface Engineering, and Pacific Northwest National Laboratory used EMSL's ion beam analysis and transmission electron microscopy techniques, along with resistance and coating adhesion measurements at MSU, to characterize three types of stainless steel with and without multi-layer coatings at high heat and high oxygen environments. These conditions are found inside solid oxide fuel cells, which could provide clean affordable energy powered by hydrogen. The research demonstrated that two of the coatings resulted in favorable characteristics for use in solid oxide fuel cells.

For more information, contact EMSL Communications Manager Mary Ann Showalter (509-371-6017).

Citation: Gannon PE, CT Tripp, AK Knospe, CV Ramana, M Deibert, RJ Smith, VI Gorokhovskiy, V Shutthanandan, and D Gelles. 2004. "High-temperature Oxidation Resistance and Surface Electrical Conductivity of Stainless Steels with Filtered Arc Cr-Al-N Multilayer and/or Superlattice Coatings." *Surface and Coatings Technology* Volumes 188-189, November-December 2004, pp. 55-61. Proceedings of the 31st International Conference on Metallurgical Coatings and Thin Films.

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Research into coatings that could make stainless steel viable for use under extreme conditions in fuel cells is a hot paper according to Science Direct. (a) Schematic drawing of the multilayer structure of the coatings consisting of repeated sections of CrN and a CrAlN superlattice. (b) Transmission electron microscopy image of the multilayer coating showing the CrN (dark bands) and CrN/AIN superlattice (light bands).