
Interest in composites formation to improve electroless nickel coatings properties.

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Abstract

Electroless nickel plating involves the deposition of a metallic-metalloid alloy layer on substrate by electrochemical reactions in aqueous solution without the need of external current. Electroless nickel deposits possess interesting properties such as uniform thickness, good adhesion, high hardness, wear resistance, good corrosion resistance. There are two major classes of electroless nickel coatings depending on the reducing agent used: nickel-phosphorous (Ni-P) and nickel-boron (Ni-B). Ni-B coatings are known to be smooth, hard and wear resistant, but have moderate corrosion resistance compared to Ni-P layers that are known to provide better corrosion resistance, but lower mechanical properties. The formation of duplex Ni-B/Ni-P coatings or multilayers Ni-B/Ni-P could be a good compromise for all those properties: Duplex coatings with a Ni-B layer at the top are the best candidate in as-plated conditions and multilayers coatings present better wear resistance than monolayers and good corrosion resistance with a medium hardness.

Biography

Fabienne Delaunois obtained her Engineering degree in metallurgy and her PhD from the The Engineering Faculty of Mons (FPMs) in 1993 and 2002 respectively. She's been working on electroless nickel-boron for nearly 25 years and is the authors of about 20 publications in that field. Their fields of research are Corrosion, Surface and heat treatments, Powder metallurgy, Metallic materials and Materials recycling. She realizes also many expertise for industries in the fields of ferrous and non-ferrous alloys, such as physical metallurgy, heat treatments, corrosion and failure analysis. She is nowadays Associate Professor and Department Head in the Metallurgy Laboratory, at the Engineering Faculty of the University of Mons, Belgium, where she teaches Mechanical and materials properties, Physical Metallurgy, Ferrous and non-ferrous alloys, Special steels and metallic alloys, Recycling and waste management, and Engineering projects. She also teaches Physical Metallurgy at the University of Valenciennes Hainaut-Cambresis in France. She chaired the Chemistry and Materials Science Department from the Engineering Faculty of UMONS from 2010 to 2016 and is a member of the board of Materia Nova and BCRC-INISMA. She is involved in different professional societies such as ASM International, ASM Chapter BeNeLux, International Failure Analysis Society (Chair of the Technical Commity of Books & Handbooks), A3TS, SF2M and COST (ES1407 ReCreew).