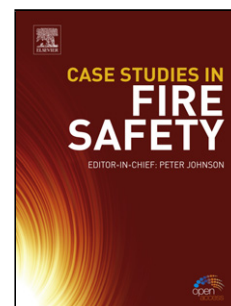


Accepted Manuscript

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PII: S0010-938X(18)30697-8
DOI: <https://doi.org/10.1016/j.corsci.2018.06.013>
Reference: CS 7569

To appear in:

Received date: 19-4-2018
Revised date: 6-6-2018
Accepted date: 10-6-2018

Please cite this article as: Calado LM, Taryba MG, Carmezim MJ, Montemor MF, Self-healing ceria-modified coating for corrosion protection of AZ31 magnesium alloy, *Corrosion Science* (2018), <https://doi.org/10.1016/j.corsci.2018.06.013>

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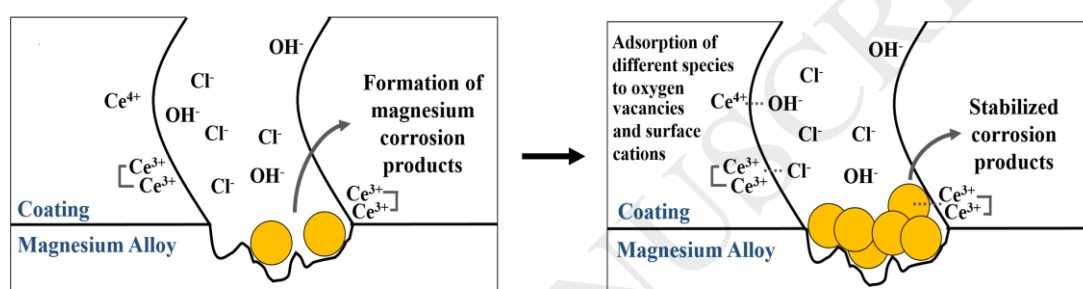
Self-healing ceria-modified coating for corrosion protection of AZ31 magnesium alloy

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Graphical abstract



Highlights

- Modification of hybrid epoxy-silane coating with ceria nanoparticles
- Ceria leads to improved and stable corrosion protection of AZ31
- Delay of corrosion propagation in the presence of ceria
- Enhanced corrosion protection with low concentration of ceria nanoparticles

Abstract

A hybrid siloxane-based coating was modified with CeO_2 nanoparticles and applied on AZ31. The corrosion protection performance was evaluated via electrochemical impedance spectroscopy (EIS) in 0.05 M NaCl. CeO_2 -modified coating showed improved and more stable protective performance compared to the blank coating. Localized healing of the modified coating was studied via scanning vibrating electrode technique (SVET), scanning ion-selective electrode technique (SIET) and localized electrochemical impedance spectroscopy (LEIS). Addition of ceria led to lower cathodic activity in 0.05 M NaCl and alkalization was kept

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