Mini Review

A Review on Self-Healing Coatings Applied to Mg Alloys and Their Electrochemical Evaluation Techniques

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Magnesium (Mg) and its alloys are being used as substitutes for conventional structural materials due to their helpful characteristics, such as low density and exceptional mechanical properties. However, the electrochemical stability of Mg and its alloys inhibits their utilization in various applications. Therefore, the development of active self-healing coatings that can not only protect Mg alloys at the experimental scale but also be utilized at the commercial scale is imperative. The study of self-healing coatings for Mg alloys is increasing at an unexpected rate. However, the mechanisms of self-healing and their electrochemical evaluations for inorganic coatings are scarcely summarized for Mg alloys. In the present appraisal, a comprehensive overview is provided for both self-healing mechanisms and evaluation techniques that have been utilized for Mg alloys. Finally, a future perspective of self-healing coatings and evaluation techniques is provided that illuminates the lack of information that is available and confirms that a substantial amount of work is needed to fill those research area gaps for Mg alloys.

Keywords: Magnesium alloys, self-healing, evaluation techniques, coatings, electrochemistry

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