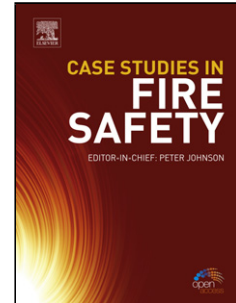


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On the importance of irreversibility of corrosion inhibitors for active coating protection of AA2024-T3

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HIGHLIGHTS:

- Inhibitor leaching followed by fast and effective irreversible inhibition are key criteria for active protective coatings.
- BTA and 2-MBT show better intrinsic inhibition than lithium carbonate when studied in bulk electrolytes
- Lithium carbonate, BTA and 2-MBT demonstrated to be able to leach from an organic coating matrix.
- Organic corrosion inhibitors, BTA and 2-MBT, exhibit a reversible corrosion inhibitive nature.
- Lithium carbonate provides the key characteristics of corrosion inhibitors for active protective coatings: leaching, fast, effective and irreversible corrosion inhibition.

Abstract

Inhibitor leaching, fast, effective and irreversible passivation are essential for active protective coatings to protect aluminium alloys. This study presents the comparison of the active protective properties of lithium carbonate and two organic corrosion inhibitors, benzotriazole and 2-mercaptobenzothiazole, on aluminium alloy 2024-T3 with a special focus on the irreversibility of the inhibition. A combined approach of electrochemical measurements, optical observations, surface roughness and weight-loss measurements revealed the reversible inhibition behaviour of benzotriazole and 2-mercaptobenzothiazole on AA2024-T3. On the contrary, lithium carbonate

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