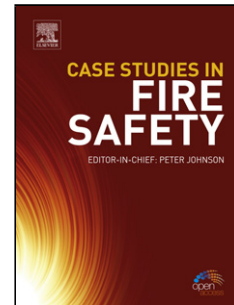


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Conversion of steel by polyphenolic model molecules: corrosion inhibition mechanism by rutin, esculin, esculetol

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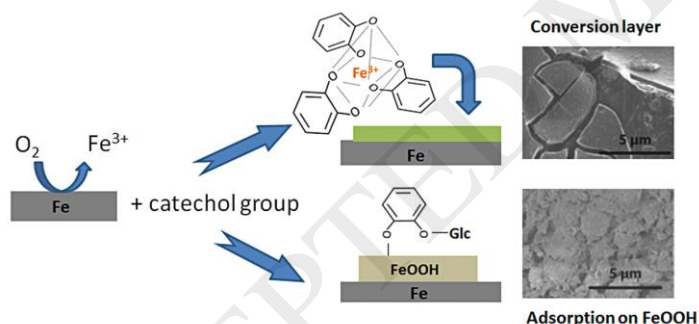
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Graphical abstract



Highlights

- Radical scavenging properties of antioxidant molecules induce cathodic inhibition.
- Free-catechol molecules form an octahedral tri-catecholate complex with iron (III).
- The growth of a conversion film of catecholate complex provides an anodic inhibition.
- Glycosylated catechol molecules are rather adsorbed on oxidized iron film.

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