

Special Issue on
**Eco-Friendly Corrosion Inhibitors: Recent Developments
and Applications for Steel in Concrete**

CALL FOR PAPERS

For reinforced concrete structures exposed to salt-laden environments, the chloride-induced corrosion of reinforcing steel is the major cause for their premature deterioration and degradation. The use of corrosion inhibitors seems to be a promising solution in controlling rebar corrosion by changing the local environment at the steel-concrete interface. In general, the corrosion inhibitors can be used for newly built concrete structures (admixed inhibitor) or for the preexisting structures (migrating inhibitors, surface applied). Nitrite based inhibitors are considered to be the most effective admixed inhibitor. Calcium nitrite is the first admixed inhibitor commercialized on a large scale for reinforced concrete. However, nitrite had the potential for transplacental carcinogenicity, coming from both human epidemiological studies and experimental animals.

For metals and alloys, in order to replace the traditional toxic corrosion inhibitors, recently researchers have developed new classes of corrosion inhibitors, dealing with plant extracts, drugs, natural polymers, lanthanide compounds, and so forth. However, there are various challenges that restrict their application for steel in concrete. For example, the effective protection of one inhibitor for steel in neutral or acidic solution could not be the basic to assume that similar products would also work well for steel in concrete.

In fact, the admixing of corrosion inhibitors in fresh mortar might alter the morphology and microstructure of the hardened mortar; thus the inhibitor-loaded nanocontainers (clay based nanocontainers, etc.) would be the promising solution for using the admixing of corrosion inhibitors in concrete.

On the other hand, the application of inhibitors on the concrete surface requires a long time for migrating into proximity of the reinforcing steel. On this direction, the electrical injection of corrosion inhibitors (EICI) is a relatively new technique to drive inhibitor ions into concrete. EICI could eliminate the need for ongoing and long-term maintenance.

This special issue aims to emphasize the eco-friendly corrosion inhibitors and their promising applications for steel in concrete.

We sincerely invite high quality original research and review papers on the theoretical, experimental, and practical studies addressing this issue.

Potential topics include but are not limited to the following:

- ▶ Plants extracts based corrosion inhibitors
- ▶ Natural polymers based corrosion inhibitors
- ▶ Drugs based corrosion inhibitors
- ▶ Rare earth compounds based corrosion inhibitors
- ▶ Green corrosion inhibitors and their application for steel in concrete
- ▶ Inhibitor-loaded nanocontainers and their application for steel in concrete
- ▶ Electrical injection of corrosion inhibitor for corrosion protection of reinforced concrete

Authors can submit their manuscripts through the Manuscript Tracking System at <https://mts.hindawi.com/submit/journals/ijc/ecird/>.

Papers are published upon acceptance, regardless of the Special Issue publication date.

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