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【704】 Effect of water uptake on durability of carbonated concrete studied by neutron imaging and electrochemical technique

Concrete carbonation may lead to steel corrosion in reinforced concrete, while the moisture content at the steel surface is also essential. To study the time-dependent behavior of moisture penetration and steel corrosion, this study employed neutron imaging to monitor water uptake, and steel corrosion state was measured by the electrochemical technique. This combined experiment revealed that the arrival of water front at the steel surface led to a sharp decrease in steel potential. The corrosion rate increased dramatically within a couple of minutes. This study highlights the importance of considering the coupled corrosion and moisture transport behavior during active corrosion when carbonated concrete is exposed to cyclic wetting/drying conditions.

Author: ZHANG, Zhidong

Co-authors: Dr TRTIK, Pavel (PSI); Prof. ANGST, Ueli (ETH Zurich)

Presenter: ZHANG, Zhidong

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