Webinar Announcement

EFC Event n°535

Corrosion in geothermal energy production

26 June 2025 10h30-16h (CET)

https://insa-lyon-fr.zoom.us/j/98849892568?pwd=5hCoUCJboMKZXkLMpaGSkmiRV5YQvA.1

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For the reduction of greenhouse gas emissions, investment in the infrastructure of green energy sources is necessary. Geothermal energy is one of the promising ways to achieve this objective by delivering thermal and electrical power. Due to the high corrosiveness and scaling ability of geothermal fluids, the selection of appropriate metallic materials and inhibitors is a big challenge for the safety and reliability of the equipment used for geothermal energy sources.

The objectives of this webinar are to exchange on knowledge of the corrosion, scaling, inhibition mechanisms, the selection of proper remedies (as materials, inhibitors) and their application for reliable developments of geothermal energy production. Some achievements of GeoSteelCor project funded by ANR (French National Research Agency) will also be presented.

	Title	Presenters	Institute / Company
10l30-10h35	Opening	Francois Ropital,/Jean Kittel	GeoSteelCor Project / EFC WP26
10h35-11h05	High-Temperature Material Testing for Corrosion Challenges in Geothermal Environments	Sigrún Nanna Karlsdóttir	University of Island
11h05-11h35	Corrosion studies to increase lifetime of geothermal wells in the Upper Rhine Graben	Guillaume RAVIER, Corentin PENOT	ESG and Vallourec
	Break		
11h40-12h10	Corrosion investigation for deep geothermal application in the Upper Rhine Valley	Roman Zorn, Petra Huttenloch, Dietmar Kuhn, Elisabeth Schröder	Eifer and KIT
12h10-12h30	GeoSteelCor Project - 1: Methodologies to study the impact of minrEal scales on uniform and localized corrosion	Francois Ropital, Sabrina Marcelin, Nicolas Mary, Francois Grosjean, Gaurav Joshi, Jean Kittel	INSA Lyon and IFP Energies nouvelles
	Lunch Break		
14h-14h20	A Cooperation to Develop Environmentally Responsible Solutions for Upper Rhine Graben Geothermal Field	Hermann Kempen, Argyro Spinthaki, Pablo Gonzalez, Hande Sile, Florian Landry, Duygu Disci,Christophe Foret	Kurita
14h20-14h40	Materials interactions in geothermal plants - not just an aspect of durability	Ralph Baessler	BAM
	Break		
14h50-15h10	Investigating the characteristics of $FeCO_3$ corrosion product layers, and their influence on the CO_2 corrosion rate of carbon steel	Amber Sykes,Richard Barker	University of Leeds
15h10-15h40	GeoSteelCor Project - 2: Methodologies to study the impact of minral scales stress corrosion cracking	Christophe Liotard, Cedric Bosch, Rita Costadias	Institut de la Corrosion / Ecole des Mines de St Etienne
15h40-16h00	*Conclusion*		

Presentation of GeoSteelCor Project ANR 21-CE05-0024 1-11-2021 au 30-10-2025

Due to the high corrosiveness of geothermal fluids and their ability to form mineral deposits, selecting appropriate metallic materials is a challenge for its development. One of the main scientific challenges addressed by the project is understanding the mechanisms of crack initiation and propagation at the mineral deposit/steel interface. The use of the CorRTEx platform offers a unique opportunity to reproduce the temperature and pressure range of geothermal operations (up to 350°C and 200 bar). A heat exchanger system equipped with electrochemical measurements has been implemented inside the loop to monitor the formation of deposits. The impact of brine compositions and geothermal field conditions on the formation of deposits and localized corrosion of carbon and stainless steels have been studied in the laboratory and in the CorRTEx loop, using electrochemical methodologies and characterizations of the steel-mineral deposit interfaces. To study stress corrosion cracking (SCC) phenomena, several mechanical testing devices combined with electrochemical measurements, were implemented in the loop. The impact of mineral deposits on the different stages of crack initiation and propagation from localized corrosion defects was studied using a combination of constant load tests and slow strain rate tests before and after formation of the mineral deposits on both types of steel.