

Why Should We Teach and Learn Corrosion?

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The *aim* of this lecture is to show attractive, fascinating, and amusing faces of subject of corrosion.

Corrosion subject has entered as a part of required course of program in chemical education at many schools, as a part of voluntary subject of program in materials science, chemical and mechanical engineering, and chemistry in some colleges and universities.

During the long teaching of the subject of corrosion in universities and colleges, I came across astounding situations in which scientists and engineers called the same things by different names or used wrongly and confused some designations and definitions in corrosion science and engineering, and electrochemistry. I will clear up some terminology confusion.

Technological processes with participation of flammable, explosive and toxic substances at chemical and metallurgical plants proceed in metallic equipment. The contact of chemicals and metals represents a great corrosion risk and danger for people and the environment. Smooth operation can be carried out when there are equipment functions without failures. Only knowing causes of corrosion, its mechanism, corrosion control measures, methods of corrosion monitoring, and principles of chemical cleaning of equipment, engineers can manage chemical processes with low risk of corrosion failures.

Corrosion, as any subject in our diverse and contradictory world, has two sides to a coin, as the two-faced Janus, deteriorative and beneficial faces, and we have to distinguish between them.

Such unexpected approach to corrosion phenomena helps in teaching and education of the subject of corrosion and makes it attractive for new generations of students, young engineers and scientists. The common denominator in this approach, teaching and learning the subject of corrosion is *beauty*. My experience is summarized in the book "*Corrosion for Everybody*", two other books published by Springer, and the last book in Hebrew published in Israel in 2022.

Dr. Alec Groysman biography



Dr. Alec Groysman graduated from the Chemico-Technological University named after Mendeleev in Moscow. He received his Ph.D. in physical chemistry and corrosion. He has experience in corrosion, corrosion control and corrosion monitoring from 1976 in the oil refining, oil and gas, petrochemical, and chemical industry and teaching the subject of corrosion.

He has lived in Israel since 1990. He worked for 22 years for oil refinery Haifa and at the same time taught corrosion science and technology in universities (Technion, Haifa; Bar-Ilan University, Tel Aviv, Ariel University) and College of Engineering (Karmiel, Israel). He is an Honor President of Israeli Association of Chemical Engineers and Chemists.

He deals with kinetics and thermodynamics of corrosion processes, on-line corrosion monitoring, choice and use of corrosion inhibitors, coating systems, selection of appropriate alloys for corrosive service, failure analysis, corrosion management, and assessment of corrosion risk.

He has special interests in corrosion education and in searching for relationships between corrosion, art, history, and philosophy.

His first book ***“Corrosion for Everybody”*** published by Springer in 2010 received the innovation award winner of Materials Performance Readers' choice in 2012 year in the USA.

His second book ***“Corrosion in Systems for Transportation and Storage of Petroleum Products and Biofuels”*** was published by Springer in 2014.

His third book ***“Corrosion Problems and Solutions in Oil Refining and Petrochemical Industry”*** came to life by Springer in 2016.

He is an author of five chapters about corrosion monitoring and corrosion control in five books.

He is a lecturer of the courses “Materials and Standards in Oil and Gas Engineering” and “Corrosion and Corrosion Control” in the Technion (Israel Institute of Technology), Haifa, Israel.

He was a visiting Erskine Fellow and taught “Corrosion of Engineering Materials” at Mechanical Engineering and Chemical Engineering Departments at the University of Canterbury, Christchurch, New Zealand in 2017.

He was a visiting lecturer, delivering the course “Corrosion of Construction Materials” at Civil Engineering Institute, Department of Construction of Unique Buildings and Structures, and the course “Corrosion Problems and Solutions in Oil Refining and Petrochemical Industry”, St. Petersburg State Polytechnic University named after Peter the Great, Russia, May 2019.

He was a visiting lecturer, delivering the course “Corrosion of Pipelines”, Materials Engineering Department, University of British Columbia, Pipeline Integrity Institute, Vancouver, Canada, September 2019.

He is a lecturer of on-line corrosion courses in Israel, Canada, Russia, and Kazakhstan.

He wrote the first text-book “Corrosion: Monitoring, Control, and Prevention” in Hebrew in 2022.