

## Case Study 3

### **Corrosion Analysis of Materials under Severe Process Conditions**

Corrosion is and continues to be an expensive problem that plagues industries such as petroleum and refining, waste, coatings and linings, transportation, pulp and paper, and power to name a few. According to a recent article on the economic effects of metallic corrosion in the United States, over \$100 billion dollars per year result from avoidable corrosion.

Corrosion is the deterioration of a material due to its interaction with the surrounding environment. It is critical that industries, dealing with reactive chemicals/materials, assess the reactivity and corrosivity of their materials/chemicals under the proposed process conditions including plant materials of construction. More often than not, very limited data on a particular corrosion phenomenon is available at the desired process condition for specific materials of construction. Therefore, laboratory testing of coupons is the quickest and most satisfactory means to determine reactivity and corrosivity of chemicals to various materials. The findings of the laboratory studies would assist with resolving process problems, implement process improvements, and allow for improved transportation containment by identifying suitable materials of construction for problematic chemicals.

**Chilworth Technology has the expertise, special facilities, and equipment needed for testing of materials for corrosion studies under extreme conditions of temperature (350°C) and pressure (10,000psi).** To better understand corrosion phenomena we offer state-of-the-art investigative techniques. The range of techniques include but is not limited to a variety of advanced surface characterization methods, i.e., scanning electron microscopy (SEM), energy dispersive x-ray (EDX), and transmission electron microscopy (TEM). This approach provides micro-analytical analyses to better define failure mechanisms, as well as examination and identification of corrosion products.

Working at high temperatures and pressures, basically pushes the boundaries of the science and technology of our understanding of corrosion effects and mechanisms. Our experts will work with you to obtain a clearer understanding of your corrosion related problems. We can develop custom test methodologies, which can then simulate your process or field conditions including a worst-case scenario. Our goal is to generate reliable data that will assist you to solve a wide array of corrosion related problems and allow your project to proceed under a wide variety of conditions.

*Chilworth Technology, Inc. has fully equipped laboratories to conduct all the required tests and consulting staff to conduct corrosion studies under extreme conditions of temperature. If you have any questions or wish to speak to a process safety specialist regarding any process safety concern, please contact us at 609-799-4449 or email us at [safety-usa@chilworthglobal.com](mailto:safety-usa@chilworthglobal.com).*