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Antimicrobial nano alloys

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Severe and rapid corrosion is the most common cause of failure in industrial systems such as power plants, oil and gas, urban infrastructure, and materials exposed to fresh water and sea water. It is well recognized that chemical and microbial mechanisms contribute to corrosion. An estimated 40% of all internal pipeline corrosion and 65% of thecorrosion in the Shipping industry can be attributed to Microbiologically Influenced Corrosion (MIC). Today, 80% of the world's trade volume is transportedin ships whose ballasts are particularly sensitive to MIC as they are continuously flushed and filled with sea water containing microbes. Corrosion rate son ballasts due to MIC are widely reportedin literature as is bio film formation on their surfaces. These microbes create a serious problem as they reduce the structural lifetime of metal components. Pipe failure is a main component of the operating and maintenance costs of gas industry pipelines. Currently, oil and gas companies do not have many choices in prevention of internal pipe corrosion. Many producers spend significant amounts of money each month to flush the pipes with various chemicals and biocides to kill off the sulfur--producing bacteria. Researchers at West Texas A&M University have developed a newcoating that can be applied to existing metal surfaces and prevents microbial corrosion. Unlike other paints orchemicals that are currently on the market, this antimicrobial nano alloy (ANA) coating is activated through combustion synthesis and for msa structural metallic alloy. The ANA coating enhances temperature, abrasion, and corrosion resistance. In experiments designed to test for resistance, 99 percent of bacteria that were exposed to the ANA coated surface died. This technology is currently being scaled up for manufacturing and production. There are several industries for which this material has potential impact including pharmaceutical, healthcare, medicine, as well as food and public health.

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