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Assessment of bacteria participation in deposits formation inside the steel pipeline through X-ray diffraction studies

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Most surveys concerning problems of microbiologically induced corrosion in water pipelines have been carried out using hydrated samples of sediments. However, sometimes it may be necessary to use older, naturally dehydrated deposits to determine participation of biofilms in MIC. The possibility of using the self-dehydrated sediments for MIC investigation might eliminate problems associated with storing the samples. Some publications suggest that the corrosion mechanism and also type of bacteria which have participated in corrosion can be evaluated through the presence of specific crystalline phases among the corrosion products. The aim of this study was to determine the participation of microorganisms in corrosion of steel pipe which was previously used in drinking water distribution system. The qualitative and quantitative analyses of naturally dehydrated sediments sampled from the inside wall of pipe was performed using the X-ray diffraction method. Based on the presence of specific crystalline phases, the specific mechanisms of corrosion influenced by sulphate reducing bacteria and iron oxidizing bacteria may be taken into account as contributing to corrosion of tested steel pipe.

Biography

Alicja Hryniszyn has obtained Master of Engineering from Silesian University of Technology (SUT), as a specialist in environmental biotechnology. Since 2011 until now she is a PhD student at the Faculty of Energy and Environmental Engineering in SUT. She has participated in courses involving application of the atomic force microscope as well as of the Raman spectrometer. She also participated in the research project "Investigation of the influence of biofilm of *Desulfovibrio desulfuricans* bacteria on implantation titanium alloys", financed by the Polish National Science Center.

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