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## PRACA DOKTORSKA

*Udział bakterii w powstaniu osadów obecnych  
w skorodowanych rurach wodociągowych*

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Gliwice 2016

## Summary

The majority of publications involving microbiologically induced corrosion in drinking water distribution systems include hydrated sediments studies. „Initially dehydrated” sediments have not been studied yet, playing special attention to the possibility of microbial participation in their formation and contribution to microbiologically induced corrosion.

The aim of performed studies was to determine the possibility of bacterial participation in deposits formation, based on results obtained through infrared spectroscopy (DRIFTS technique) and X-ray diffraction – identification of crystalline phases occurring in collected samples and determination of quantitative composition of samples by Rietveld method.

DRIFTS results showed that drying conditions of initially dehydrated deposits may impact on samples composition. Intensity of absorption bands was the lowest for lyophilized samples. Drying of samples in air at temperature of 22°C was the least invasive samples preparation method

DRIFTS analysis showed the amides, polypeptides, fatty acids, oligosaccharides and polysaccharides presence in deposits collected from steel pipe, indicating the biofilm presence.

DRIFTS analysis demonstrated the presence of dipicolinic acid especially for deposits collected from steel pipe, indicating the participation of endospore-forming bacteria in their formation.

XRD results indicate the contribution of electrical microbially influenced corrosion to deposits formation by sulfate reducing bacteria. It was also suggested that bacteria reducing iron and magnetotactic bacteria were involved in deposits formation inside steel pipe. The calcite in deposits from cast iron pipe supplied with hard water indicated microbial corrosion absence. The presence of magnetite, hematite and goethite in samples collected from steel pipe suggested the contribution of iron oxidising bacteria to corrosion or abiotic corrosion.

