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## MIC in Circulating Cooling Water System

PDF (Size: 145KB) PP. 203-206 DOI : 10.4236/jwarp.2012.44022

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### ABSTRACT

MIC is one of the main problems of circulating cooling water system. The direct economic loss by MIC is about 300 to 500 billion dollars. It is good to understand MIC in order to control MIC. Source and species of microorganisms was introduced firstly. There are three kinds of microorganisms in the system, including bacteria, fungi and algae. Species of these microorganisms are shown in the paper. Then, mechanisms of MIC are analysed. Although there is no universal mechanism of MIC, MIC is still mainly an electrochemical corrosion in nature. Meanwhile, the mechanisms on SRB and iron bacteria are introduced in details. At last, several methods of microorganisms control are put forward in the paper.

### KEYWORDS

Circulating Cooling Water System; MIC; Microorganisms Species; Mechanism Of MIC; Control Methods

### Cite this paper

 P. Xu, Z. Xu, J. Wang, Y. Zhang and L. Zhang, "MIC in Circulating Cooling Water System," *Journal of Water Resource and Protection*, Vol. 4 No. 4, 2012, pp. 203-206. doi: 10.4236/jwarp.2012.44022.

### References

- [1] T. Reg Bott, " Industrial Biofouling," Elsevier, Lobdon, 2011.
- [2] H.-C. Flemming, " Economical and Technical Overview," In: E. Heitz, H.-C. Flemming and W. Sand, Eds., *Microbially Influenced Corrosion of Materials*, Springer-Verlag, Heidelberg, 1996. doi:10.1007/978-3-642-80017-7\_2
- [3] D. Walsh, D. Pope, M. Danford, et al., " The Effect of Microstructure on Microbiologically Influenced Corro- sion," *Journal of the Minerals Metals and Materials So- ciety*, Vol. 45, No. 9, 1993, pp. 22-30. doi:10.1007/BF03222429
- [4] P. Zhang, " Research on Biofouling Growth Characteristic and Control in the Circulating Cooling Wate System," M.Sc. Thesis, University of Petroleum of China, Beijing, 2010.
- [5] P. R. Puckorius, " Water Corrosion Mechanisms," *Water Treatment*, Vol. 5, 1999, pp. 57-61.
- [6] G. H. Booth and A. K. Tiller, " Cathodic Characteristics of Mild Steel in Suspensions of Sulfa Reducing Bacteria," *Corrosion Science*, Vol. 8, No. 8, 1968, pp. 583-600. doi:10.1016/S0010-938X(68)80094-0
- [7] W. P. Iversion, " Direct Evidence for the Cathodic Depo- larization Theory of Bacterial Corrosion," *Science*, Vol. 151, No. 3713, 1966, pp. 986-988. doi:10.1126/science.151.3713.986
- [8] I. B. Beech, J. A. Sunner and K. Hiraoka, " Microbe-Sur- face Interactions in Biofouling and Biocorrosion Proc- esses" , *International Microbiology*, Vol. 8, No. 3, 2005, pp. 157-168.
- [9] H. A. Videla and L. K. Herrera, " Microbiologically In- fluenced Corrosion: Looking to the Future," *International Microbiology*, Vol. 8, No. 3, 2005, pp. 169-180.
- [10] W. Wang, J. Wang, H. Xu and X. Li, " Some Multidisciplinary Technique Used in MIC Studies" , *Materials and Corrosion*, Vol. 57, No. 7, 2006, pp. 531-537. doi:10.1002/maco.200503951

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- [11] Z. Lewandowski and H. Beyenal, " Mechanisms of Microbially Influenced Corrosion. Springer Series on Bio- films," Marine and Industrial Biofouling, Vol. 4, No. 1, 2009, pp. 35-64. doi:10.1007/978-3-540-69796-1\_3
- [12] W. A. Hamilton, " Sulphate Reducing Bacteria and Their Role in Biocorrosion," Biofouling and Biocorrosion in Industrial Water Systems, Springer-Verlag, Berlin Heidel- berg, 1990, pp. 187-193.
- [13] G. Gill, " What Is biocorrosion," Biofouling and Biocorrosion in Industrial Water Systems, Springer-Verlag, Berlin Heidelberg, 1990, pp. 155-164.
- [14] J. Y. Luo, H. Z. Wang and P. Xu, " Control the Impact of Microorganisms When Reclaimed Water