



**"Gheorghe Asachi" Technical University of Iasi, Romania**



---

## THE INFLUENCE OF SYNTHETIC AND ENVIRONMENTALLY FRIENDLY SCALE AND CORROSION INHIBITORS ON THE BIODEGRADATION OF POLLUTANTS

Iosif Lingvay<sup>1\*</sup>, Dănuț-Ionel Văireanu<sup>2</sup>, Kinga Öllerer<sup>3</sup>, Carmen Lingvay<sup>1</sup>

<sup>1</sup>National Institute of Research and Development in Electrical Engineering, 313 Spl. Unirii, 030138 Bucharest, Romania

<sup>2</sup>"Politehnica" University of Bucharest, Faculty of Applied Chemistry and Material Science, 1-7 Polizu Str.,  
011061 Bucharest, Romania

<sup>3</sup>Institute of Biology - Romanian Academy, 296 Spl. Independentei, 060031 Bucharest, Romania

---

### Abstract

Synthetic scale corrosion inhibitors used in closed loop thermal systems, but especially in open systems, accumulate in nature. Recently, a number of studies have been published concerning the possibilities of using natural plant extracts for the inhibition of corrosion and scale formation. In this idea, the paper presents the results of microbiological determinations regarding the effect of such a product, frequently used in households - Calgon - and that of plant extracts on the development of some fungi, and implicitly on their capacity to biodegrade some pollutants of anthropogenic origin (polyethylene and paper). During the experiments we used garlic, horse chestnut and walnut extracts. The inoculation was carried out with 11 fungal species. The addition of Calgon inhibited the development of fungi, and implicitly their capacity to microbiologically degrade PE and paper, while the addition of garlic and chestnut extract favoured the development of fungi, increasing their capacity to biodegrade PE and paper. Based on the fact that on PE and paper samples treated with plant extracts the development of fungi was better, we assume that biodegradation is favoured in this situation, in comparison with samples treated with Calgon. Further studies are required in order to elucidate the way in which these synthetic products influence biodegradation.

*Key words:* corrosion, fungi, microbiological degradation, plant extracts, scale inhibitors

*Received:* July 2010; *Revised final:* July, 2011; *Accepted:* August, 2011

---