

# Influence of Yttrium in Mg-1Ca-0.5Mn-nY biodegradable alloys (n = 1,2,3)

Istrate Bogdan<sup>1,a</sup>, Munteanu Corneliu<sup>1,b\*</sup>, Lupescu Stefan<sup>1,c</sup>, Cimpoesu Nicanor<sup>2,d</sup>, Benchea Marcelin<sup>1,e</sup>, Cimpoesu Ramona<sup>2,f</sup>, Stanciu Sergiu<sup>2,g</sup>

<sup>1</sup>“Gheorghe Asachi” Technical University of Iasi, Faculty of Mechanical Engineering,  
43 “D. Mangeron” Street, 700050, Iasi, Romania

<sup>2</sup>“Gheorghe Asachi” Technical University of Iasi, Faculty of Material Science and  
Engineering, 61-63 “D. Mangeron” Street, 700050, Iasi, Romania

<sup>a</sup>bogdan\_istrate1@yahoo.com, <sup>b\*</sup>cornelmun@gmail.com, <sup>c</sup>lupescustefan@ymail.com,  
<sup>d</sup>nicanornick@yahoo.com, <sup>e</sup>marcelin\_ben@yahoo.com, <sup>f</sup>ramonahanu@yahoo.com,  
<sup>g</sup>sergiustanciu2003@yahoo.com

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## Abstract.

The Mg-based biodegradable alloys reveal important features for their use in the medical field. These materials must develop high mechanical strength, low Young modulus correlated with good corrosion resistance. In this study, the influence of Yttrium (1, 2, 3%) on Mg-1Ca-0.5Mn-nY biodegradable alloys was investigated. Microstructural analysis were performed by SEM and XRD techniques, some mechanical properties were revealed by the microscratch method and the indentation method and also the samples were subjected to electrochemical tests in Ringer's solution for obtaining the corrosion rate.

The results showed that alloying these materials with Yttrium, the microstructure became more homogeneous, improving the corrosion resistance. The formation of intermetallic compounds of Mg<sub>2</sub>Ca type, respectively Mg<sub>24</sub>Y<sub>5</sub>, has been highlighted. The modulus of elasticity had very low values for alloys of 1% and 2% Yttrium, compared to 3% Yttrium biodegradable alloy.

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