Komitet za termodinamiku i fazne dijagrame Srbije

u saradnji sa:

Fakultetom tehničkih nauka u Kosovskoj Mitrovici,
Tehničkim fakultetom u Boru i
Associated Phase Diagram and Thermodynamics Committee
(Poland, Czech Republic, Hungary, Bulgaria, Slovenia, Serbia, Montenegro, Romania, Croatia, Bosnia and Herzegovina)

JEDANAESTI SIMPOZIJUM O TERMODINAMICI I FAZNIM DIJAGRAMIMA

sa međunarodnim učešćem

ZBORNIK IZVODA RADOVA

Kosovska Mitrovica,
23-24. jun 2023. god.

Jedanaesti simpozijum o termodinamici i faznim dijagramima

Izdavač:
Fakultet Tehničkih nauka
Kneza Miloša br.7, 38220 Kosovska Mitrovica
Tel/Fax: (+381 28) 425-320 / 425-322
office@ftn.pr.ac.rs

Za izdavača:
Dekan,
Prof. dr Srđan Jović

Urednik:
Prof. dr Duško Minić

Kompjuterska obrada:
Doc. dr Aleksandar Đorđević

Godina izdavanja:
2023

Tiraž: 100 primeraka
ISBN: 978-86-81656-63-1

Štampa: SaTCIP d.o.o. Vrnjačka Banja

Na osnovu člana 55. stav. 1. tačke 8. i 38. Statuta Fakulteta tehničkih nauka u Kosovskoj Mitrovici, Nastavno-naučno veće na svojoj sednici održanoj dana 10.02.2023. godine, donelo je ODLUKU br. 126/3-8 o organizovanju naučnog skupa u 2023. godini, pod naslovom: „Jedanaesti simpozijum o termodinamici i faznim dijagramima“.

Simpozijum je finansijski podržan od strane Ministrastva nauke, tehnološkog razvoja i inovacija Republike Srbije

Jedanaesti simpozijum o termodinamici i faznim dijagramima

Naučni odbor

Prof. dr D. Minić, Srbija, predsednik,
Prof. dr M. Zečević, Srbija
Prof. dr D. Manasijević, Srbija
Prof. dr Y. Du, Kina
Prof. dr G. Kaptay, Mađarska
Prof. dr J. Vreštal, Češka Republika
Prof. dr I. Katayama, Japan
Prof. dr G.P. Vassilev, Bugarska
Prof. dr J. Medved, Slovenija
Prof. dr J. Lamut, Slovenija
Prof. dr A. Udovsky, Rusija
Doc. dr T. Holjevac Grgurić, Hrvatska
Prof. dr D. Blečić, Crna Gora
Prof. dr D. Ćubela, BiH
Dr V. Ćosović, Srbija
Dr N. Talijan, Srbija
Prof. dr N. Štrbac, Srbija
Dr A. Kostov, Srbija
Dr M. Sokić, Srbija
Dr B. Marković, Srbija

Organizacioni odbor

Doc. dr. A. Đorđević, predsednik
Prof. dr D. Minić,
Prof. dr M. Zečević,
Prof. dr D. Manasijević,
Doc. dr Lj. Balanović,
dipl. inž. J. Petrović
dipl. inž. M. Mitrović

Sadržaj

Plenarno predavanje:

Izvodi radova:

The influence of solution heat treatment temperature on mechanical and structural properties of the EN AW-6060 and EN AW-6082 aluminium alloys

Uroš Stamenković, Ivana Marković

University of Belgrade, Technical Faculty in Bor, VJ 12, Bor, Serbia

Abstract

Aluminium alloys from the 6000 series are very susceptible to precipitation hardening (ageing). The process of precipitation hardening includes solution heat treatment (heating and quenching) and ageing at a defined temperature and time. The parameters that define all three of these processes have a direct impact on mechanical, physical, and structural properties. One of these parameters is the solution heat treatment temperature. The influence of solution heat treatment temperature on the microhardness and microstructure of the EN AW-6060 and EN AW-6082 aluminium alloys was studied in this paper. The investigated alloys were solution heat treated (SHT) at five different temperatures, ranging from 510 °C to 590 °C. The influence of solution heat treatment temperature on microhardness was investigated in three different stages: immediately after quenching, after quenching and partial ageing (180 °C, 1 h) and after quenching and full ageing (180 °C, 5-6 h). The samples that exhibit the lowest and highest values of microhardness after the quenching and full ageing were separated and examined by optical microscopy. Results show that the increase in solution heat treatment temperatures leads to an increase in microhardness due to better homogenization and better dissolution of the equilibrium phases.

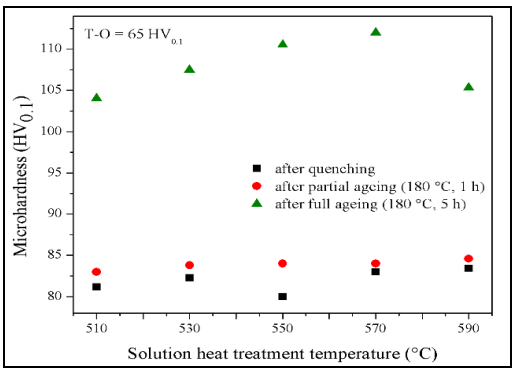
Acknowledgement

The research presented in this paper was done with the financial support of the Ministry of Science, Technological Development and Innovation of the Republic of Serbia, within the funding of the scientific research work at the University of Belgrade, Technical Faculty in Bor, according to the contract with registration number 451-03-47/2023-01/200131.

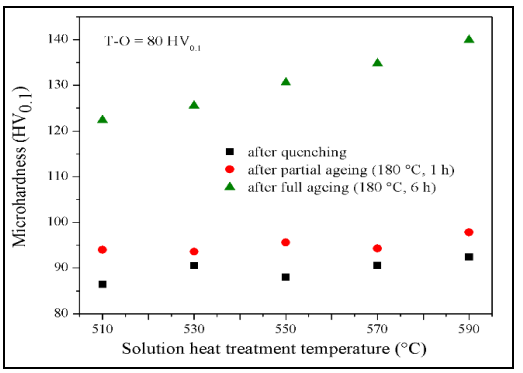
References

1. I. M. Masoud, T. Abu Mansour, J. A. Al-Jarrah, Journal of Applied Sciences Research, 8 (10) (2012) 5106-5113.
2. C. F. Tan, M. R. Said, Chiang Mai Journal of Science, 36 (3) (2009) 276-286.
3. G. Mrówka-Nowotnik, Archives of Materials Science and Engineering, 46 (2) (2010) 98-107.

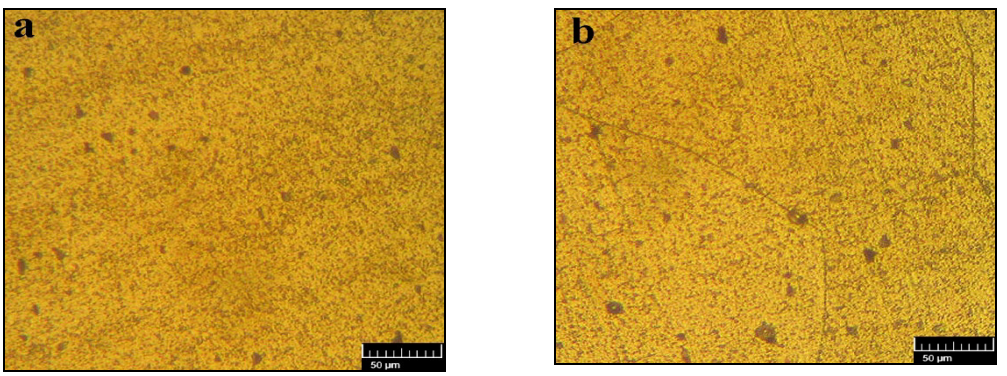
Graphical abstract:



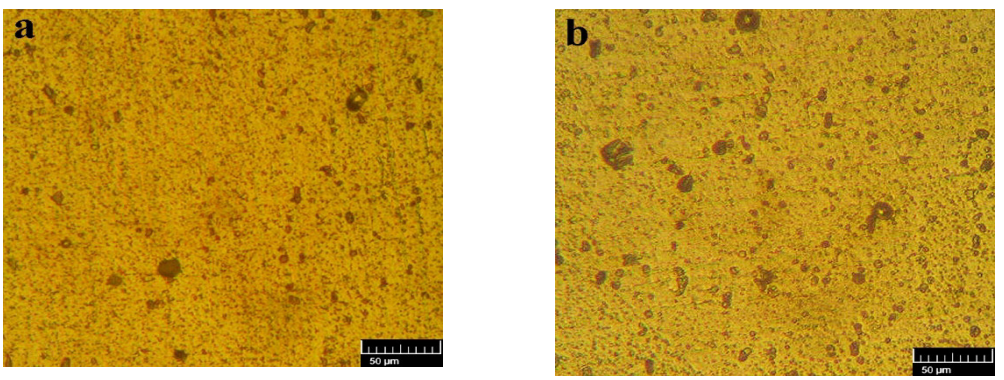
The influence of solution heat treatment temperature on the microhardness of the EN AW-6060 alloy.



The influence of solution heat treatment temperature on the microhardness of the EN AW-6080 alloy.



Microstructure of the EN AW-6060 alloy after solution heat treatment at different temperatures and full ageing: a) SHT at 510 °C and b) SHT at 570 °C.



Microstructure of the EN AW-6082 alloy after solution heat treatment at different temperatures and full ageing: a) SHT at 510 °C and b) SHT at 590 °C.