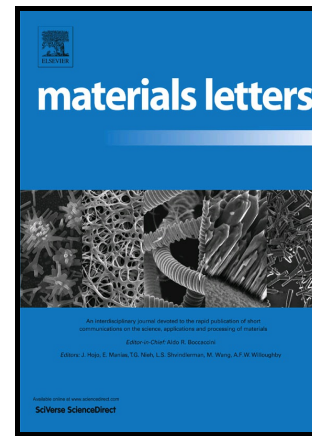


Author's Accepted Manuscript

Study of hydrogen influence on 1020 steel by low deformation method

B.G. Mytsyk, Ya.L. Ivanytskyi, A.I. Balitskii, Ya.P. Kost', O.M. Sakharuk



www.elsevier.com

PII: S0167-577X(16)31344-1
DOI: <http://dx.doi.org/10.1016/j.matlet.2016.08.065>
Reference: MLBLUE21349

To appear in: *Materials Letters*

Received date: 10 February 2016
Revised date: 1 August 2016
Accepted date: 13 August 2016

Cite this article as: B.G. Mytsyk, Ya.L. Ivanytskyi, A.I. Balitskii, Ya.P. Kost' and O.M. Sakharuk, Study of hydrogen influence on 1020 steel by low deformation method, *Materials Letters* <http://dx.doi.org/10.1016/j.matlet.2016.08.065>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain

Study of hydrogen influence on 1020 steel by low deformation method

B.G. Mytsyk, Ya.L. Ivanytskyi, A.I. Balitskii, Ya.P. Kost', O.M. Sakharuk*

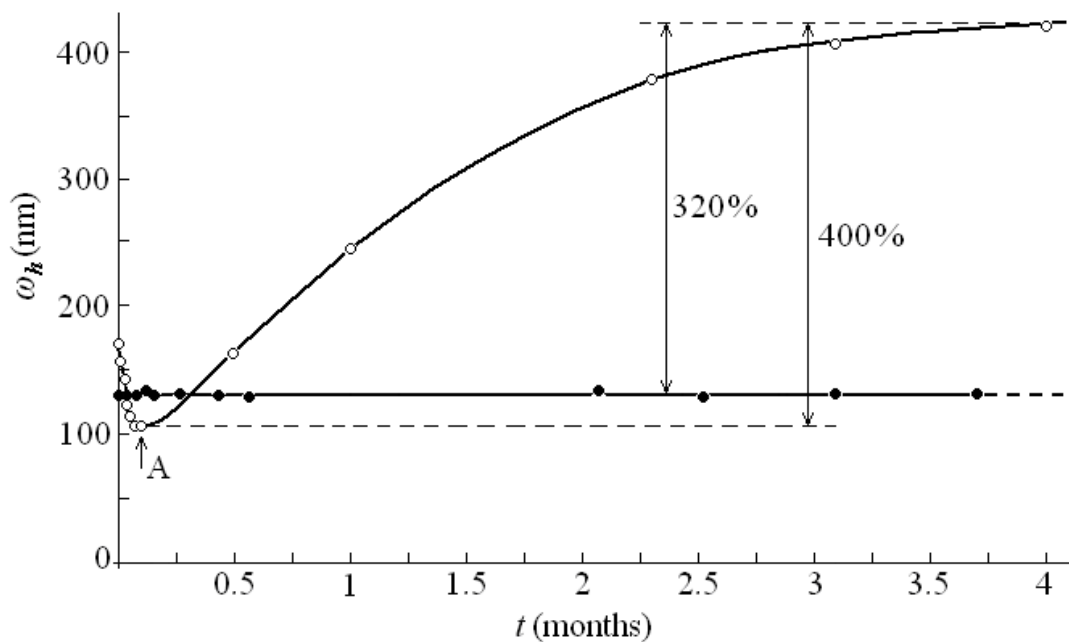
Karpenko Physico-Mechanical Institute of NAS of Ukraine; 5, Naukova str., Lviv 79601, Ukraine

*Corresponding author. Tel.: +380 322 633388; fax: +380 322 649427. sakharuk@ipm.lviv.ua

Abstract

Low mechanical deformation method was utilized to reveal effects of hydrogen plasticification of steel 1020, which do not depends on value of mechanical stress as in known mechanisms of hydrogen embrittlement, but only depends on hydrogen state in metal: diffused hydrogen plasticizes metal, and residual hydrogen, concentrated in defects, causes considerable increase of its embrittlement. "Giant" increase of elastic hysteresis amplitude during long-continued (4 months) ageing of hydrogenated steel 1020, which is indication of appropriate decrease of its cyclic durability, was detected. New conception of hydrogen plasticification and embrittlement increase in metals were formulated. It was shown that metal after hydrogen yield does not renovate its mechanical characteristics.

Graphical abstract



Keywords: low mechanical stress, steel 1020, hydrogen influence, plasticity, embrittlement.

1. Introduction

Hydrogen influence on metals is a subject of intensive study during recent years (see for instance, reviews in [1–3]). It is caused by important applicative importance of such researches.

Download English Version:

<https://daneshyari.com/en/article/8016154>

Download Persian Version:

<https://daneshyari.com/article/8016154>

[Daneshyari.com](https://daneshyari.com)