

論文 / 著書情報
Article / Book Information

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| 題目(和文) | |
| Title(English) | Investigation of Plastic Deformation Behavior with the Portevin-Le Chatelier Effect in Austenitic Stainless Steel |
| 著者(和文) | LEESeungyong |
| Author(English) | Seungyong Lee |
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| Category(English) | Doctoral Thesis |
| 種別(和文) | 論文要旨 |
| Type(English) | Summary |

(博士課程)
Doctoral Program

論文要旨

THESIS SUMMARY

系・コース： 材料 系
Department of Graduate major in コース
学生氏名： LEE Seungyong
Student's Name

申請学位(専攻分野)： 博士 Engineering
Academic Degree Requested Doctor of
指導教員(主)： Nobuo Nakada
Academic Supervisor(main)
指導教員(副)： Susumu Onaka
Academic Supervisor(sub)

要旨(英文300語程度)
Thesis Summary (approx.300 English Words)

In order to clarify the Portevin-Le Chatelier (PLC) effect on plastic deformation in metallic materials deeply, deformation behavior was investigated in Fe-19Cr-13Ni-0.2(C or N) austenitic stainless steels by high-temperature tensile testing equipped with Digital Image Correlation (DIC) system at various temperatures 473-823 K and strain rates 1.0×10^{-2} - 5.0×10^{-5} s⁻¹. The PLC effect originated from dynamic strain aging separately appeared at two different temperature ranges 723-823 K and 473-623 K, which were attributed to the pipe diffusions of substitutional Cr and interstitial C, respectively. DIC analysis revealed that the nucleation and propagation behavior of the PLC band varied depending on temperature and strain rate, which leads to the variation of serrated flow on stress-strain curve. A numerical simulation based on dislocation dynamics suggested that the variation of the PLC band behavior is caused by the spatial-temporal coupling effect related to strain rate.

備考：論文要旨は、和文2000字と英文300語を1部ずつ提出するか、もしくは英文800語を1部提出してください。

Note: Thesis Summary should be submitted in either a copy of 2000 Japanese Characters and 300 Words (English) or 1 copy of 800 Words (English).

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