

Opera Software



 Mantenha o contato

# AIP

 Journal of Applied Physics

HOME

BROWSE

MORE ▾

[Home](#) > [Journal of Applied Physics](#) > [Volume 121, Issue 19](#) > [10.1063/1.4983669](#)


&lt; PREV

NEXT &gt;

 No Access

Submitted: 08 November 2016

Accepted: 03 May 2017

Published Online: 18 May 2017

## Cd and In-doping in thin film SnO<sub>2</sub>

 Journal of Applied Physics **121**, 195303 (2017); <https://doi.org/10.1063/1.4983669>

 Juliana Schell<sup>1,2</sup>,  Doru C. Lupascu<sup>2</sup>,  Artur Wilson Carbonari<sup>3</sup>, Ronaldo Domingues Mansano<sup>4</sup>, Rafael. S. Freitas<sup>5</sup>,  João Nuno Gonçalves<sup>6</sup>, Thien Thanh Dang<sup>7</sup>, ISOLDE collaboration<sup>1</sup>, and Reiner Vianden<sup>7</sup>

View Affiliations

View Contributors



Topics ▾


 PDF

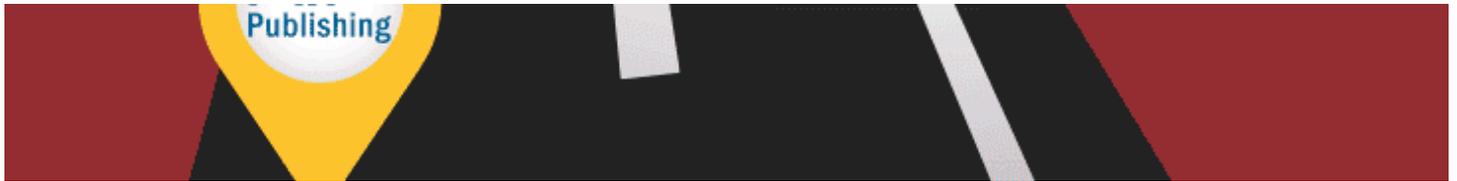
In this paper, we investigate the effects of doping in the local structure of SnO<sub>2</sub> by measuring the hyperfine interactions at impurity nuclei using the Time Differential Perturbed Gamma-Gamma Angular Correlation (TDPAC) method in addition to density functional theory simulations. The hyperfine field parameters have been probed as a function of the temperature in thin film samples. The experimental results reveal that <sup>117</sup>Cd/In and <sup>111</sup>In/Cd are incorporated and stabilized in the SnO<sub>2</sub> lattice replacing the cationic site. Significant differences in the electric field gradient were observed from TDPAC measurements with both the probe nuclei. Furthermore, the absence of strongly damped spectra further indicates that implanted Cd atoms (for <sup>117</sup>Cd/In probe nuclei measurements) easily occupy regular substitutional Sn sites with good stability. The simulated value for the electric field gradient obtained with the first oxygen neighbor removed is closer to the experimental value observed for <sup>117</sup>Cd, which also indicates this configuration as stable and present in the sample.

## ACKNOWLEDGMENTS

The research leading to these results is related to the ISOLDE experiment LOI144 and has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 654002, from the Federal Ministry of Education and Research, BMBF, through grants 05K13TSA and 05K16PGA, and from Fundação para a Ciência e a Tecnologia, FCT project CERN-FIS-NUC-0004-2015. In particular, J. Schell extends her thanks to the German Academic Exchange Service, DAAD, in collaboration with Conselho Nacional de Desenvolvimento Científico e Tecnológico, CNPq, through the fellowship Grant No.



HISKP, Bonn, for the implantations and the warm hospitality. Dr. J. G. Martins Correia and the ISOLDE in-house group, in particular the RILIS team, are thankfully acknowledged for great discussions and technical support during the beam time.



## Resources

[AUTHOR](#)

[LIBRARIAN](#)

[ADVERTISER](#)

---

## General Information

[ABOUT](#)

[CONTACT](#)

[HELP](#)

[PRIVACY POLICY](#)

[TERMS OF USE](#)



 [PDF](#)



Website © 2022 AIP Publishing LLC.

Article copyright remains as specified within the article.

**Scitation**



 PDF