



Contribution ID: 370

Type: **Poster Presentation**

## Magnetic properties and magnetocaloric effect in NdPd<sub>2</sub>Al<sub>2</sub>

Thursday, 28 June 2018 15:00 (2 hours)

The magnetic properties and magnetocaloric effect (MCE) of the ternary intermetallic NdPd<sub>2</sub>Al<sub>2</sub> compound have been investigated by means of X-ray diffraction (XRD), magnetic susceptibility  $\chi(T)$ , magnetization  $M(\mu_0H)$ , isothermal magnetization  $M(\mu_0H, T)$  and MCE measurements. XRD studies indicate a tetragonal crystal structure with space group P4/nmm (No.: 129). The low temperature  $\chi(T)$  data exhibits a maximum characteristic of antiferromagnetic (AFM) phase transition at  $T_N = 3.2$  K. At high temperature, the  $\chi(T)$  data follows the Curie – Weiss relation with effective magnetic moment  $\mu_{\text{eff}} = 3.654(5)$   $\mu_B$  and a Weiss temperature  $\theta_p = -3.3(4)$  K. The value of  $\mu_{\text{eff}}$  obtained is close to the value of 3.62  $\mu_B$  expected for the free Nd<sup>3+</sup> - ion. The magnetization data indicate metamagnetic transition at low magnetic field and a tendency toward saturation at high field. Arrot – plots indicate a second – order phase transition. The MCE effect was estimated from the isothermal magnetization to be 18 J/(kg.K) for a field change of 7 T. The characteristic behaviour of the isothermal magnetic entropy change points to a second – order character of the AFM phase transition as observed from the Arrot - plots.

**Please confirm that you have carefully read the abstract submission instructions under the menu item "Call for Abstracts" (Yes / No)**

Yes

**Consideration for student awards**  
**Choose one option from those below.**  
N/A  
Hons  
MSc  
PhD

MSc

**Supervisor details**  
**If not a student, type N/A.**  
**Student abstract submission requires supervisor permission: please give their name, institution and email address.**

M.B. Tchoula Tchokonte, University of the western cape, mtchokonte@uwc.ac.za

**Primary authors:** Mr MASEVHE, Mbulunge (University of the western cape); Prof. TCHOKONTE, Moise Tchoula (University of the western cape)

**Co-authors:** Prof. STRYDOM, Andre (University of Johannesburg); Dr SAHU, Baidynath (University of Johannesburg); Dr KACZOROWSKI, Dariusz (Polish Academy of science); Mr MBOUKAM, Jean (University of the western cape)

**Presenter:** Mr MASEVHE, Mbulunge (University of the western cape)

**Session Classification:** Poster Session 2

**Track Classification:** Track A - Physics of Condensed Matter and Materials