9.7 cm

# SPIN REORIENTATION AND THERMAL EXPANSION OF LATTICE PARAMETERS IN $TmFeO_3$

**A. Bombik[a], J. Kusz[b], A.W. Pacyna[c], J. Przewoźnik[a]**

[a] Faculty of Phys. Nucl. Techniques, Mining and Metallurgy University, Kraków

[b] Institute of Physics, University of Silesia, Katowice, Poland

[c] Henryk Niewodniczański Institute of Nuclear Physics, Kraków, Poland

Temperature dependences of lattice parameters were examined for both single crystal and powder samples of $TmFeO_3$ orthoferrite. The single crystal study was performed on X-ray four circles Huber diffractometer between 10 K and 300 K while powder measurements were carried out using a Simens D-5000 diffractometer from 70 K up to 300 K. Lattice constant temperature dependences determined from single crystal and powder measurements are consistent in the covered temperature range. The thermal expansion coefficients are anisotropic. For the $b$ direction it is almost constant at all measured temperatures while for $a$ and $c$ ones they show considerable temperature dependences. Expansion coefficients are positive above spin reorientation region and negative below. Lattice parameters $a$ and $c$ reach their minimum values within spin reorientation range (approx. 80-100 K). The low temperature behaviour of $a$ and $c$ lattice parameters seems to originate from a magnetostriction effect of $TmFeO_3$.

This work was supported by research grant No 2 P03B 035 14 from State Committee for Scientific Research.

13.4 cm

**Subject category :**

4. Rare Earths and Actinides, Alloys and Compounds

**Presentation mode :**
poster

**Corresponding author :**
Andrzej W. Pacyna

**Address for correspondence :**
Instytut Fizyki Jądrowej im. Henryka Niewodniczańskiego
ul. Walerego Eljasza Radzikowskiego 152
31-342 Kraków

**Email address :**
Andrzej.Pacyna@ifj.edu.pl