

atoms N1 from two independent heterocyclic cations participate in the bifurcated hydrogen bonds N–H...O, O'. Three dimensional spatial package of crystals of the compound I is more dense ( $\rho_c=1.547 \text{ g.cm}^{-3}$ ) than lamellar package of 8-aminoquinolinium bis(citrato)borate terahydrate crystals ( $\rho_c=1.453 \text{ g.cm}^{-3}$ ) [1]. Crystals I are triclinic, space group  $P\bar{1}$ :  $a=10.6678(3) \text{ \AA}$ ,  $b=14.2920(3) \text{ \AA}$ ,  $c=16.4891(4) \text{ \AA}$ ,  $\alpha=78.106(1)^\circ$ ,  $\beta=75.368(1)^\circ$ ,  $\gamma=85.919(1)^\circ$ ,  $V=2379.8(1) \text{ \AA}^3$ ,  $Z=4$ ,  $R=0.054$ ,  $wR2=0.133$  for 10562 independent reflections with  $R(\text{int})=0.0266$ .

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#### MS27 P09

**Isothermal section at 800°C of the Gd-Fe-Ge ternary system** R. Ben Hassen<sup>a</sup>, M. Jemmali<sup>a,b</sup>, S. Walha<sup>a</sup>, O. Tougait<sup>b</sup>, H. Noël<sup>b</sup>, <sup>a</sup>*Unité de chimie des matériaux, Université Tunis El Manar, Tunis, Tunisia.* <sup>b</sup>*Sciences chimiques de Rennes UMR 6226, CNRS-université de Rennes 1, Avenue du Général Leclerc, F-35042 Rennes, France.*

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**Keywords:** intermetallic phase equilibrium, intermetallic compounds crystal structure, intermetallic compounds synthesis

The investigation of the Gd-Fe-Ge system is part of an ongoing research project with the aim to clarify the phase equilibrium in ternary system of Gd and iron with a p-

block element. This ternary system has been partially investigated; the phase diagrams established at 800°C show two compounds. **A:**  $\text{Gd}_1\text{Fe}_2\text{Ge}_2$  ( $a = 3.995$ ,  $c = 10.46 \text{ \AA}$ , I4/mmm,  $\text{ThCr}_2\text{Si}_2$  structure type) [1], **B:**  $\text{Gd}_1\text{Fe}_6\text{Ge}_6$  ( $a = 5.128$ ,  $c = 4.076 \text{ \AA}$ , P6/m 2/m2/m,  $\text{YCo}_6\text{Ge}_6$  structure type) [2]. We present here our experimental results on the Gd-Fe-Ge ternary system, studied in the whole concentration range at an isotherm of 800°C. All the samples were prepared by arc-melting the elemental components, followed by heat-treatment of one week. The phases in alloys were determined by electron-probe microanalysis and examined by X-ray powder diffraction analysis (X-ray diffractometer with  $\text{CoK}\alpha$  radiation with iron filters) in order to determine the phase compositions and the equilibrium lines within the ternary system. In addition to the known phases, a new ternary phase,  $\text{Gd}_3\text{Fe}_1\text{Ge}_6$ , has been found and its crystal structure was refined from powder.  $\text{Gd}_3\text{Fe}_1\text{Ge}_6$ , this new ternary phase crystallizes in the orthorhombic space group Cmcn ( $n^\circ 63$ ) with the lattice parameters  $a = 4.151$ ,  $b = 16.062$  and  $c = 4.0239 \text{ \AA}$ , structure type  $\text{CeNiSi}_2$ . This phase shows a significant homogeneity range which extends between the compositions  $\text{GdFe}_{1-x}\text{Ge}_2$  ( $0.55 \leq x \leq 0.75$ ).

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