configuration with two non-equivalent tridentate ligands with O,N,O donors:
one of the ligands having deprotonated semicarbazido fragment, whereas for the other additional deprotonation involves the pyridine nitrogen.
The compound crystallizes in the P-1 space group with \( a=8.7273(3)\) Å, \( b=12.3030(4)\) Å, \( c=14.3589(6)\) Å, \( a=109.118(3)\), \( \beta=100.490(3)\), \( \gamma=101.860(3)\), \( V=1372.79\) Å³.

Keywords: iron(IV) complex; pyridoxal semicarbazone; octahedral configuration

Study of Solid State Reaction in Pb (Zr, Ti) O₃
Ceramics Doped with (Fe²⁺, Ni²⁺, Sb³⁺) Ions
C. Benhamidéche⁶, H. Allaïb⁵, A. Boutarfaia⁵, S. E. Bouaoud³, "Institut des sciences fondamentales, Université de Skikda, Route d’El-Hadaiek-Skikda, Skikda (21000)-Algérie. "Laboratoire de chimie moléculaire du contrôle de l’environnement et des mesures physico-chimiques, Université de Mentouri-Constantine, Route Ain El Bey, Constantine (25000)-Algérie. "Laboratoire de chimie appliquée, Université de-Biskra (07000)-Algérie.
E-mail: chahrazedb2002@yahoo.fr

Lead zirconate titanate Pb(Zrₙ,Ti₁₋ₙ)O₃ or (PZT) ceramics are of great technological interest due to their excellent piezoelectric and ferroelectric properties. Such piezoelectric materials often used in ultrasonic generators, hydrophones, electronic buzzers and ringers, pressure and stress sensors, etc [1]. In general, the PZT are processed by the traditional solid-state reaction. However, there are undesirable features such as nonstoichiometry, compositional fluctuation and poor microstructure because of the high-temperature processes [2]. Therefore, it is necessary to process PZT ceramic at a temperature as low possible. Low firing temperature processing ceramic fabrication demands fine precursor powders of high homogeneity of components. The formation of Pb(Zr, Ti)O₃ has been studied with several kinds of starting materials by several authors who suggested a large number of reaction mechanisms[3], [4]. The phase assemblages and appearance of intermediate reaction products will depend on the precursor powders that have been employed (specifically, their purity and particle size) and the time and temperature at which the solid state reaction has been allowed to proceed. To investigate the reaction sequence through which PZT solid solutions are formed by solid-state reactions in a mixture of PbO+TiO₂+ZrO₂, researchers have performed several series of calcinations tests, but came up with different conclusions. There have been contradictory observation, particularly with respect to the presence or absence of intermediate products like PbZrO₃, PbTiO₃ solid solution (PT) and a PbO solid solution (P)⁵.

The purpose of this study was to investigate lead zirconate titanate PZT and addition a small amount of Fe₂O₃, Ni, Sb₂O₃ were synthesized by single phase perovskite PZT powders were obtained after treatment at low temperature, the effects of calcination temperature on lattice parameters and tetragonality of PZT powders have been discussed, differential thermal analysis (DTA) and thermal gravimetric analysis (TGA).
The formation of PZT is accomplished through several steps: decomposition of PbO to PbO₂ formation of PbTiO₃ above 400°C and of its solid solution at 600°C.


Keywords: PZT; RX; thermal properties

Crystal Structure of Bipyridine Type Ligand L₁=N,N-bis-pyridin-2-ylmethylenep-naphthalene-1,5-diamine, Niloofar Akbarzadeh, T., Ali R. Rezvani④
Department of Chemistry, University of Sistan and Baluchestan, P. O. Box 98135-674, Zahedan, Iran
E-mail: ni_akkabzadeh@hamoon.usb.ac.ir

The current interest in the crystal engineering of polymeric coordination networks stems from their potential applications as zeolite like materials for molecular selection, ion exchange and catalysis as well as in the variety of architectures and topologies [1-2]. One of the basic strategies for crystal engineering utilizes metal-ligand bonding between transition metals and organic ligands to create coordination polymers.

In designing these polymers the properties of linking ligands such as various coordination modes, variable lengths and relative orientation of donor atoms obey a fundamental role in determining the structural outcomes of target polymers. A novel bipyridine-type linking ligand L₅=(C₂(py)-CH=N-C₅H₅-N=CH(C₂(py))- Fig. 1) was prepared by the Schiff-base condensation and fully characterized by spectroscopic methods and single-crystal X-ray diffraction. The unit cell parameters are: space group P2₁⁄c with a = 4.8666(8) Å, b