

## Structural characterization, thermal, dielectric, vibrational properties and molecular motions in $[\text{C}_3\text{N}_2\text{H}_5]_6[\text{Bi}_4\text{Br}_{18}]$ .

### Autorzy

Anna Piecha

Ryszard Jakubas

Adam Pietraszko

Jan Baran

Wojciech Medycki

Danuta Kruk

### Rok wydania

2009

### Czasopismo

Journal of Solid State  
Chemistry

### Numer woluminu

182

### Strony

2949-2960

### DOI

[10.1016/j.jssc.2009.08.007](https://doi.org/10.1016/j.jssc.2009.08.007)

### Kolekcja

Naukowa

### Język

Angielski

### Typ publikacji

Artykuł

### Streszczenie

$[\text{C}_3\text{N}_2\text{H}_5]_6[\text{Bi}_4\text{Br}_{18}]$  has been synthesized and characterized by the X-ray (at 293 and 110 K), calorimetric, dilatometric and dielectric measurements. At room temperature it crystallizes in the monoclinic space group,  $C2/m$ . A crystal structure consists of disordered imidazolium cations and ordered discrete tetramers of  $[\text{Bi}_4\text{Br}_{18}]^{6-}$ . This compound reveals a rich polymorphism in a solid state. It undergoes three solid–solid phase transitions: from phase I to II at 426/423 K (heating–cooling), at 227 K and at 219.5/219 K. A clear dielectric relaxation process is found in the room temperature phase II. Infrared studies of the polycrystalline  $[\text{C}_3\text{N}_2\text{H}_5]_6[\text{Bi}_4\text{Br}_{18}]$  showed that the  $\nu_1$  (ring) and modes of the imidazolium cations appeared to be very sensitive to the phase transition.  $^1\text{H}$  NMR measurements confirmed a key role of the imidazolium cations in the phase transitions mechanisms at low temperatures.

### Słowa kluczowe

Imidazolium, Bismuthate(III), Phase transition, Dielectric relaxation, Infrared,  $^1\text{H}$  NMR

### Adres publiczny

<https://doi.org/10.1016/j.jssc.2009.08.007>

### Strona internetowa wydawcy

<http://www.elsevier.com>

