

## Isostructural phase transition, quasielastic neutron scattering and magnetic resonance studies of a bistable dielectric ion-pair crystal $[(\text{CH}_3)_2\text{NH}_2]_2\text{KCr}(\text{CN})_6$ .

### Autorzy

Magdalena Rok  
Grażyna Bator  
Bartosz Zarychta  
Błażej Dziuk  
Jarosław Repeć  
Wojciech Medycki  
Michaela Zamponi

G. Usevičius

M. Šimenas

J. Banys

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### Streszczenie

We have synthesised and characterised a novel organic–inorganic hybrid crystal,  $[(\text{CH}_3)_2\text{NH}_2]_2\text{KCr}(\text{CN})_6$ . The thermal DSC, TMA, DTG and DTA analyses indicate two solid-to-solid structural phase transitions (PTs). According to the X-ray diffraction experiments, the first PT at 220 K is isostructural, since it does not involve a change of the space group. This transition occurs between the states, where the  $(\text{CH}_3)_2\text{NH}_2^+$  cations are orientationally disordered and ordered (frozen). The other reversible PT at 481 K leads to a melt-like phase similar to the one observed in plastic crystals or polar liquids. Dielectric spectroscopy has been used to characterise the switching properties of the dipole moments in the vicinity of the PTs. Continuous-wave electron paramagnetic resonance spectroscopy was employed to investigate the effect of ordering on the local environment of the  $\text{Cr}^{3+}$  ions. We have also applied the quasielastic neutron scattering (QENS) technique as well as  $^1\text{H}$  NMR spectroscopy to measure the dynamics of the  $(\text{CH}_3)_2\text{NH}_2^+$  cations residing in the inorganic framework.

### Adres publiczny

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