

Abstracts of Forthcoming Articles

The Anderson–Grüneisen Parameter for Cubic Crystals. S. R. TRIPATHI, D. C. GUPTA, AND M. N. SHARMA. Department of Physics, Lucknow University, Lucknow-226007, India. A new, simple relation for δ the Anderson–Grüneisen parameter, developed by Sharma and Tripathi, which involves fewer approximations than other complex, cumbersome equations available in literature, has been used to compute values of δ employing three different potentials viz the Varshni–Shukla, the Logarithmic, and the Rydberg's function. The comparison of these values with experimental ones indicates the suitability of Varshni–Shukla and Logarithmic potential functions for the study of the property δ .

The effect of Crystal Size on the Thermal Explosion of α -Lead Azide. M. M. CHAUDRI AND J. E. FIELD. Physics and Chemistry of Solids, Cavendish Laboratory, Free School Lane, Cambridge, England. It is shown experimentally that the critical explosion temperature of α -lead azide single crystals in air decreases with increase in size of the crystals. The mode of decomposition of the crystals was examined with optical and scanning electron microscopy, and it was found that surface decomposition took place preferentially at localized regions; crystal break-up also occurred. Calculations of explosion temperature for the case of parallelepiped shaped particles in air were made. The predicted decrease in the explosion temperature for an increase in crystal thickness from 4 to 34 μm (minimum dimension) was 6°K, whereas the experimental value was $\sim 30^\circ\text{K}$. It is suggested that the difference between the experimental and theoretical results is due to the mode of decomposition during the preexplosion period. For crystals of thickness less than $\sim 3 \mu\text{m}$ neither explosion or melting took place even for temperatures as high as 825°K.

Preparation and Properties of LnMX_3 Where Ln = Rare Earths, Bi; M = Ta, Nb, Ti, V and X = S, Se. P. C. DONOHUE. Central Research Department, E. I. du Pont de Nemours and Co., Experimental Station, Wilmington, Delaware 19898. Compounds were prepared of the general formula LnMX_3 (where Ln = all rare earths or Bi, X = S, and M = Ta or Nb; Ln = La through Tb, X = S, and M = Ti or V; Ln = La through Gd, X = Se, and M = Ta or Nb; Ln = La, X = Se, and M = Ti or V). They were prepared by reaction of the elements in evacuated silica tubes with iodine as a mineralizing agent. They form as black shiny lamella crystals which exhibit plastic deformation, good thermal and hydrolytic stability, low coefficients of friction, and metallic conductivity. The crystal structures have subcells like PbNbS_3 but the actual cells are larger and more complex. The series is isotypic with LaCrS_3 .

Defect Ferroelectrics of Type $\text{Pb}_{1-x}\text{TiO}_{3-x}$. S. SHIRASAKI, K. TAKAHASHI, H. YAMAMURA, K. KAKEGAWA, AND J. MORI. National Institute for Researches in Inorganic Materials, Sakura-Mura, Niihari-Gun, Ibaraki, Japan. A series of new ferroelectric substances of type $\text{Pb}_{1-x}\text{TiO}_{3-x}$ or $\text{Pb}_{1-x}\text{Na}_x\text{TiO}_{3-x+(y/2)}$ with perovskite-type structure was prepared by simple solid state reaction among powdered mixtures of PbO , TiO_2 , and in several cases, Na_2CO_3 , with TiO_2 in an excess. The defect materials are characterized in terms of inhomogeneously distributed vacancies, \square_{Pb} and \square_{O} at the respective equivalent lattice positions. Their ferroelectric properties are discussed in relation to those of the same type of materials precipitated aqueously and followed by firing at elevated temperatures.

The Photochemistry of Potassium Trisoxalatoferrate(III) Trihydrate in the Solid State. G. G. SAVELYEV, A. A. MEDVINSKII, V. L. SHTSHERINSKII, L. P. GEVLITCH, N. I. GAVRYUSHEVA, YU. T. PAVLYUKHIN, AND L. I. STEPANOVA. Department of General and Inorganic Chemistry, Polytechnic Institute, Tomsk, USSR. The gaseous and solid state products of decomposition on uv exposure of polycrystalline $\text{K}_3[\text{Fe}(\text{C}_2\text{O}_4)_3] \cdot 3\text{H}_2\text{O}$ have been investigated by mass spectroscopy, ir- and Mössbauer spectroscopy, and chemical and X-ray phase analysis. CO_2 and CO are obtained as photoproducts. The volume ratio, $\text{CO}:\text{CO}_2$, generated depends on the exposure conditions and approximately equals 1:3 on photodecomposition in air and 1:2 on decomposition in vacuum. Comparison of the experimental and literature data leads to the following conclusions: the Fe(II)-containing final products of photolysis,