

measured for indium-doped crystals. The results for doped as well as undoped crystals are expressed in terms of previously determined equiconcentration tracer diffusion constants using a detailed point defect model. Factors responsible for asymmetrical behavior are discussed.

Hg₂M₂F₆S et Hg₂M₂F₆O: Deux Nouvelles Familles de Pyrochlores Contenant du Mercure et des Metaux M de Transition Divalents. D. BERNARD, J. PANNETIER, AND J. LUCAS. Université de Rennes, U.E.R. Laboratoire de Chimie Minérale D, Avenue du General Leclerc, 35031 Rennes Cedex, France. New pyrochlore compounds Hg₂M₂F₆S (M = Zn, Cu, Ni, Co, Mn, Mg) and Hg₂M₂F₆O (M = Zn, Cu, Ni, Co, Mg) have been prepared and characterized. They all have a cubic structure (*Fd3m*) except Hg₂Cu₂F₆O which shows a tetragonal distortion. Refinement of crystal structures of five compounds from powder diffractometer intensities leads to a positional parameter $x(48f)$ lying from 0.315 to 0.319. The evolution of interatomic distances and independence of two networks (Hg₂X')²⁺ and (M₂F₆)²⁻ are examined.

Luminescence and Vibrational Spectra of Ba₅Li₂W₃O₁₅. G. BLASSE. Solid State Chemistry Department, Physical Laboratory, State University, Utrecht, The Netherlands. The infrared and raman spectra of Ba₅Li₂W₃O₁₅ are reported down to 200 cm⁻¹. From the internal stretching modes of the tungstate octahedra the crystallographic order between lithium and tungsten in the face-sharing octahedra can be derived. The green tungstate luminescence shows a low quenching temperature which is described with the Dexter-Klick-Russell model. The U⁶⁺ ion shows a yellow emission in Ba₅Li₂W₃O₁₅. There is ample evidence for two different U⁶⁺ centres with different decay times (10 and 80 μsec) and different emission and excitation spectra. One of these is located in a single layer of tungstate octahedra, the other in a double layer of octahedra.

Hydrothermal Crystal Synthesis in the Ho₂O₃(Yb₂O₃)-GeO₂-KF-H₂O Systems. G. A. EMELCHENKO, L. N. DEMYANETS, A. N. LOBACHEV. Institute of Crystallography, Academy of Science, Moscow, U.S.S.R. Crystallization in the Ho₂O₃(Yb₂O₃)-GeO₂-KF-H₂O systems has been investigated under hydrothermal conditions. Crystallization fields of the crystalline phases have been determined. Single crystals of Ho₂Ge₂O₇, Yb₂Ge₂O₇ (two types), K₂HoF₆, K₂YbF₆, K₂Yb₃Ge₂O₇ (*P*-type), Ho(OH)₃, Yb(OH)₃, and K₂Ge₄O₉ have been obtained. The germanates synthesized have been studied by X-ray analysis and ir-spectroscopy. Diorthogermanate Yb₂Ge₂O₇ has been found to crystallize in two structural types; the first is characterized by the usual structure that is typical for rare earth germanates, the second is new for germanates of rare earth elements. High chemical resistance is typical of these crystals. The *P*-type germanate also has a new type of structure among rare earth germanates. Some suggestions are made as to the structure of these new germanates on the basis of X-ray and ir-spectroscopic data.

Low-Temperature Heat Capacity and Magnetic Studies on DyCu₅. K. S. V. L. NARASIMHAN, M. J. KLEIN, AND R. A. BUTERA. Department of Chemistry, University of Pittsburgh, Pittsburgh, Pennsylvania 15260. Low temperature heat capacity studies on DyCu₅ revealed a λ -anomaly at 6.55 K. Evaluation of the entropy indicated that the ground state is not (2*J*+1) fold degenerate. High field magnetization data yield a moment of 9.28 μ_B at 4.2 K and 120 kOe.

Influence de la Substitution Tungstene-Niobium sur les Propriétés Cristallographiques et Dielectriques de la Solution Solide de Compositions Limites Ba_{2,50-x}Na_{2x}Nb₅O₁₅ (0,23 ≤ x ≤ 0,60) le Systeme BaNb₂O₆-(NaNbO₃)₂-(WO₃)₂ a 1050°C. J. M. REAU, B. ELOUADI, J. RAVEZ, AND P. HAGENMULLER. Laboratoire de Chimie du Solide du C.N.R.S., Université de Bordeaux I, 351 Cours de la Liberation, 33405 Talence, France. The substitution of niobium by tungsten carried out in order to study its influence on the crystallographic and dielectric properties of the solid solution Ba_{1,90}Na_{1,20}Nb₅O₁₅-Ba_{2,27}Na_{0,46}Nb₅O₁₅ creates a large bidimensional homogeneity range of a tetragonal tungsten bronze type phase in the system BaNb₂O₆-(NaNbO₃)₂-(WO₃)₂. The presence of tungsten decreases the distortion of the lattice as well as the ferroelectric Curie temperature. A transition from orthorhombic to tetragonal symmetry has been determined below Curie point.