

## Abstracts of Forthcoming Articles

*XPS Study on Valence Band Structures of Transition-Metal Trisulfides,  $TiS_3$ ,  $NbS_3$ , and  $TaS_3$ .* K. ENDO,\* H. IHARA, K. WATANABE, AND S. GONDA, Electrotechnical Laboratory, 1-1-4, Umezono, Sakura-mura, Ibaraki 305, Japan. Transition-metal trisulfides  $TiS_3$ ,  $NbS_3$ , and  $TaS_3$  with a quasi-one-dimensional structure are investigated by X-ray photoelectron spectroscopic (XPS) measurements to obtain information on the valence band structures. The band structures at the Fermi level of these compounds correspond well to their transport properties. A shoulder is observed at the top of the valence band in  $NbS_3$  and  $TaS_3$ , suggesting that this band is made up of the metal  $d_{z^2}$  electrons. The  $d_{z^2}$  band is occupied in  $NbS_3$  and  $TaS_3$  and empty in  $TiS_3$ . The characteristic features at the top of the valence band in  $NbS_3$  imply the occurrence of  $d_{z^2}$  band separation, leading to a semiconducting nature.

*On the Luminescence of Titanium-Activated Stannates.* G. BLASSE,\* G. A. M. DALHOEVEN, J. CHOISNET, AND F. STUDER, Physical Laboratory, State University, P.O. Box 80.000, 3508 TA Utrecht, The Netherlands. The luminescence of the following systems is reported:  $Li_{1.6}Zn_{1.6}(Sn_{1-x}Ti_x)_{2.8}O_8$  and  $Zn_2Sn_{1-x}Ti_xO_4$ . The luminescence properties are independent of  $x$  and cannot be due to the titanium ions. The emission transitions are ascribed to centers with energy levels within the forbidden energy gap.

*Crystallization and Phase Transformation of Sodium Orthoferrites.* S. OKAMOTO, Technological University of Nagaoka; Nagaoka; Nügaka-ken, 949-54, Japan. On heating mixtures of  $\alpha$ - $Fe_2O_3$  powder in sodium hydroxide melts at around 200°C, unstable  $\beta$ - $NaFeO_2$  crystallizes in the first reaction stage and transforms spontaneously to stable  $\alpha$ - $NaFeO_2$ . The process is typical of the Ostwald Step Rule. When  $\gamma$ - $Fe_2O_3$  is used as the starting material, instead of  $\alpha$ - $Fe_2O_3$ , stable  $\alpha$ - $NaFeO_2$  always crystallizes out. It was clearly observed that even though the reactions are of the dissolution and recrystallization type, three-dimensional structural relations can be preserved between the reactant and the product crystals. The nucleation mechanism is discussed on the basis of topotaxy.

*La spectroscopie de photoelectrons induits par rayons X et la repartition des ions cuivre  $Cu^+$  et  $Cu^{2+}$  dans les ferrites de cuivre.* A. D'HUYSSER, B. LEREBOURS-HANNOYER, M. LENGLET, ET J. P. BONNELLE,\* Laboratoire de Catalyse Hétérogène et Homogène, Université des Sciences et Techniques de Lille, 59655 Villeneuve D'Ascq Cedex, France. XPS study of copper ferrite oxide spinels  $Cu_{1-x}Fe_{2+x}O_4$  with  $0 < x \leq 0.5$  gives information about valence states and cationic distribution of copper in the spinel matrix. It appears that copper is monovalent and divalent and that  $Cu^{2+}$  and  $Cu^+$  cations are found in the tetrahedral and octahedral  $O^{2-}$  anion environments. X-Ray irradiation induces reduction of tetrahedral  $Cu^{2+}$  into tetrahedral  $Cu^+$ . The different copper types give shifted  $Cu\ 2p_{3/2}$  lines, the intensity ratios of which can be used to evaluate the relative proportions of one type on each site. There is satisfactory agreement between our results, Mössbauer spectroscopy studies, and statistical calculations of cationic distribution. The transformation under X-ray irradiation is attributed to displacement of the redox equilibrium  $Cu_{Tetra}^{2+} + Fe_{Octa}^{2+} \rightleftharpoons Cu_{Tetra}^+ + Fe_{Octa}^{3+}$  in the sites.

*Phase Diagrams of Systems  $SrF_2-(Y, Ln)F_3$ . II. Fusibility of Systems and Thermal Behavior of Phases.* B. P. SOBOLEV\* AND K. B. SEIRANIAN, Institute of Crystallography, USSR Academy of Sciences, Moscow, USSR. The phase diagrams of 14  $SrF_2-(Y, Ln)F_3$  systems are given, where  $Ln$  represents all the lanthanides except Pm and Eu. The diagrams have been constructed for temperature intervals from 850°C to the melting points according to the thermal and X-ray analysis. The fusibility diagrams for 12 systems have been obtained for the first time. The oxygen content in the specimens before and after thermal treatment was checked. The thermal behavior of the three types of solid solutions has been studied: (1) with the fluorite-type defect structure and its derivatives; (2) with the defect structure of lanthanum fluoride, and (3)  $\alpha$ - $YF_3$  ( $\alpha$ - $UO_3$ ) types. Maxima reflecting a noticeable effect of thermal stabilization on the fluorite-type structure by the heterovalent isomorphous substitution have been found for the majority of systems (with  $Ln = La-Ho$ ). The  $Sr_{1-x}Ln_xF_{2+x}$

Note. Asterisks indicate author to be addressed.