was scarcely formed due to the difference between the reactivity of $AlCl_3$ and that of $TiCl_4$. Solutions of Al_2O_3 into TiO_2 and of TiO_2 into Al_2O_3 appeared to influence the stability of phases in the codeposited Al_2O_3-TiO_2 powders. An unknown phase was detected in the powders calcined at 1200°C. It was considered to be a bronze-type compound containing H^+ and Al^{3+}. 7 figs., 4 tables, 21 refs.

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Preparation of Carbon-Ceramic Composite Materials by Use of Raw Coke (Part 4) Oxidation Resistance of C-SiC-B_4C Composite in Air Ichitaro OGAWA , Takayoshi YAMAMOTO*, Tsuyoshi HAGIO, Hisayoshi YOSHIDA and Kazuo KOBAYASHI, *Yogyo-Kyokai-Shi*, **94**, 409-14 (1986)——C-SiC-B_4C composites were made from powder mixtures of raw coke and SiC-B_4C (42 : 58 in weight) by grinding, compacting and baking in Ar gas at 2000°C. Thus, the weight loss of the composite made from the ground powder containing 30 vol% SiC-B_4C was 0.2, 0.6 and 6% after 1000°C-20 h, 1200°C-5 h and 1300°C-5 h heating respectively. X-ray diffraction analysis and IR spectroscopy showed that the specimens were coated with a liquid film of B_2O_3- or SiO_2-B_2O_3 Glass in air. 7 figs., 13 refs. [I. O.]

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HREM Analysis of SiC Grain Boundary Structure Hideki ICHINOSE, Yoshizo INOMATA* and Yoichi ISHIDA, *Yogyo-Kyokai-Shi*, **94**, 415-18 (1986)——A grain boundary of high purity SiC bicrystal grown by sublimation recrystallization method was examined by high resolution electron microscopy. The boundary was coincided with one of three models which were constructed so that

the number of dangling bond was least throughout the possible atomic arrangement at that orientation relation ship. The reason why only one structure was preferred among three in spite of the number of dangling bond was attributed to the effect of ionic bonding component of SiC crystal. 6 figs., 13 refs. [H. I.]

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Debye Length and Gas Sensor Mechanism of Undoped and Sm_2O_3-Doped ZnO Ceramics Seigen RI, Kenya HAMANO and Zenbe-e NAKAGAWA, *Yogyo-Kyokai-Shi*, **94**, 419-24 (1986)——Only specimens, whose neck radii were smaller than the Debye length, showed decrease in electrical resistivity under the admission of propane gas. This mechanism is explained by gate action of pinch-off potential at the necks. 12 figs., 2 tables, 9 refs. [S. R.]

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Fatigue Behavior of Y_2O_3-Partially Stabilized Zirconia Masahiro ASHIZUKA, Hideki KIYOHARA, Eiichi ISHIDA, Makoto KUWABARA, Yoshitaka KUBOTA* and Takaaki TSUKIDATE*, *Yogyo-Kyokai-Shi*, **94**, 432-39 (1986)——The fatigue behavior of 3 mol% Y_2O_3-patially stabilized zirconia with average grain size of 0.4 μm (Z3Y-I) and 1.0 μm (Z3Y-II) and was studied. The crack growth parameter (N) of Z3Y-I and Z3Y-II measured by the dynamic fatigue technique at 20°C was 40.8 and the N value of Z3Y-I at 250°C was 50.5. On the other hand, the N value of Z3Y-II at 250°C was 10.2. The average lifetime of Z3Y-I and Z3Y-II at 20°C and 250°C were predicted from dynamic fatigue data.

The average lifetime of Z3Y-II measured by the static fatigue technique at 250°C was 4 to 6 times the lifetime from dynamic fatigue data. The fracture surface of Z3Y-II tested by the static fatigue technique at 250°C showed fatigue surface near tensile surface and its zone size increased with decreasing applied stress and increasing time to failure. 9 figs., 2 tables, 24 refs. [M. A.]

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