Synthesis of Lanthanoid Aluminates (β-Al_20_3 Type) Using Arc Plasma Flame

Abstracts of Papers on Amorphous Materials Published in Other Journals

Unusual Glass Formation in the Al-Nd-O System

Seishi YAJIMA, Kiyohito OKAMURA and Toetsu SHISHIDO

Chemistry Letters (1973), 741.

A new oxide glass in the Al-Nd-O system was made through fusing by arc plasma torch and rapid quenching by a particular device although, in this system, so far it was very difficult to realize the glassy state. Quenched material of about 5 mm in diameter and about 1 μ in thickness was examined by polarizing microscope and by X-ray diffraction technique. The results clearly showed the existence of the glassy state.

Glass Formation in the Ln-Al-O System (Ln: Lanthanoid and Yttrium Elements)

Seishi YAJIMA, Kiyohito OKAMURA and Toetsu SHISHIDO

Chemistry Letters (1973), 1327.

Oxide glasses in the Ln-Al-O system were prepared with the molar ratio of Ln_2O_3:Al_2O_3 of 10:1 to 1:10 for all the lanthanoids and yttrium by an impact quenching technique. Each quenched material was examined by polarizing microscope, X-ray diffraction and electron diffraction. The electron diffraction patterns show diffuse halos characteristic of an amorphous state.

Synthesis of Lanthanoid Aluminates (β-Al_2O_3 Type) Using Arc Plasma Flame

Seishi YAJIMA, Kiyohito OKAMURA and Toetsu SHISHIDO

Chemistry Letters (1973), 1331.

New compounds with approximate formulas, $La_2O_3 \cdot 7Al_2O_3$, $Pr_2O_3 \cdot 7Al_2O_3$, $Nd_2O_3 \cdot 8Al_2O_3$ and $Sm_2O_3 \cdot 7Al_2O_3$, have been obtained through melting by arc plasma flame and separated into their own single phases by a proper chemical treatment. All of the compounds have the β-Al_2O_3 type structure. Excepting only $La_2O_3 \cdot 7Al_2O_3$, these compounds have the β-Al_2O_3 type structure at temperatures higher than 1500°C.

Crystallization of an Amorphous Oxide in La-Nb-O System

Seishi YAJIMA, Kiyohito OKAMURA and Toetsu SHISHIDO

Chemistry Letters (1974), 221.

An amorphous oxide of which composition corresponds to $La_2O_3 \cdot 5Nb_2O_5$ was prepared by making use of an impact quenching technique. The phase transformation from an amorphous to an equilibrium crystalline state was studied by