

## Phase equilibria in the Bi<sub>2</sub>O<sub>3</sub>-CuO-Nb<sub>2</sub>O<sub>5</sub> ternary system

### ABSTRACT

A complete subsolidus ternary phase diagram of the Bi<sub>2</sub>O<sub>3</sub>-CuO-Nb<sub>2</sub>O<sub>5</sub> (BCN) system was constructed. Careful firing control and phase analysis were applied to determine the phase assemblages and compatibilities over a wide range of temperatures, i.e. 700–925 °C. Phase-pure BCN pyrochlores were found to crystallise in cubic symmetry, space group Fd3m, No. 227 with lattice constants in the range of 10.4855 (5) <math>a</math> <math>b</math> <math>c</math> (3). The mechanism of this limited subsolidus series could be represented by a general formula, Bi<sub>3.08-2x</sub>Cu<sub>1.84+2x/9</sub>Nb<sub>3.08+7x/9</sub>O<sub>14.16+6x/9</sub> (0 ≤ x ≤ 0.36) wherein the reduction in Bi content was compensated by a proportion amount of copper and niobium together with non-stoichiometry in oxygen.

**Keyword:** Ceramics; Sintering; Powder diffraction; Phase equilibria