

SEM AND X-RAY ANALYSES OF SINTERED MgO / Bi₂O₃ BINARY SYSTEM

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Abstract

Magnesium oxide is a component of many ceramic materials. Bismuth oxide is added as an additive to ceramic materials in order to lower the sintering temperature. The influence of temperature was researched by sintering binary system: MgO/Bi₂O₃. The temperature of process was 820 °C and 1100 °C. Composition of this system was 80% of MgO and 20% Bi₂O₃. The effects of sintering, the composition and morphology were followed by X-ray diffraction and Scanning electron microscopy. It has been found that Bi₂O₃ forms intermediary unstable compound with MgO.

Keywords: MgO, Bi₂O₃, sintering, SEM, x-ray analysis

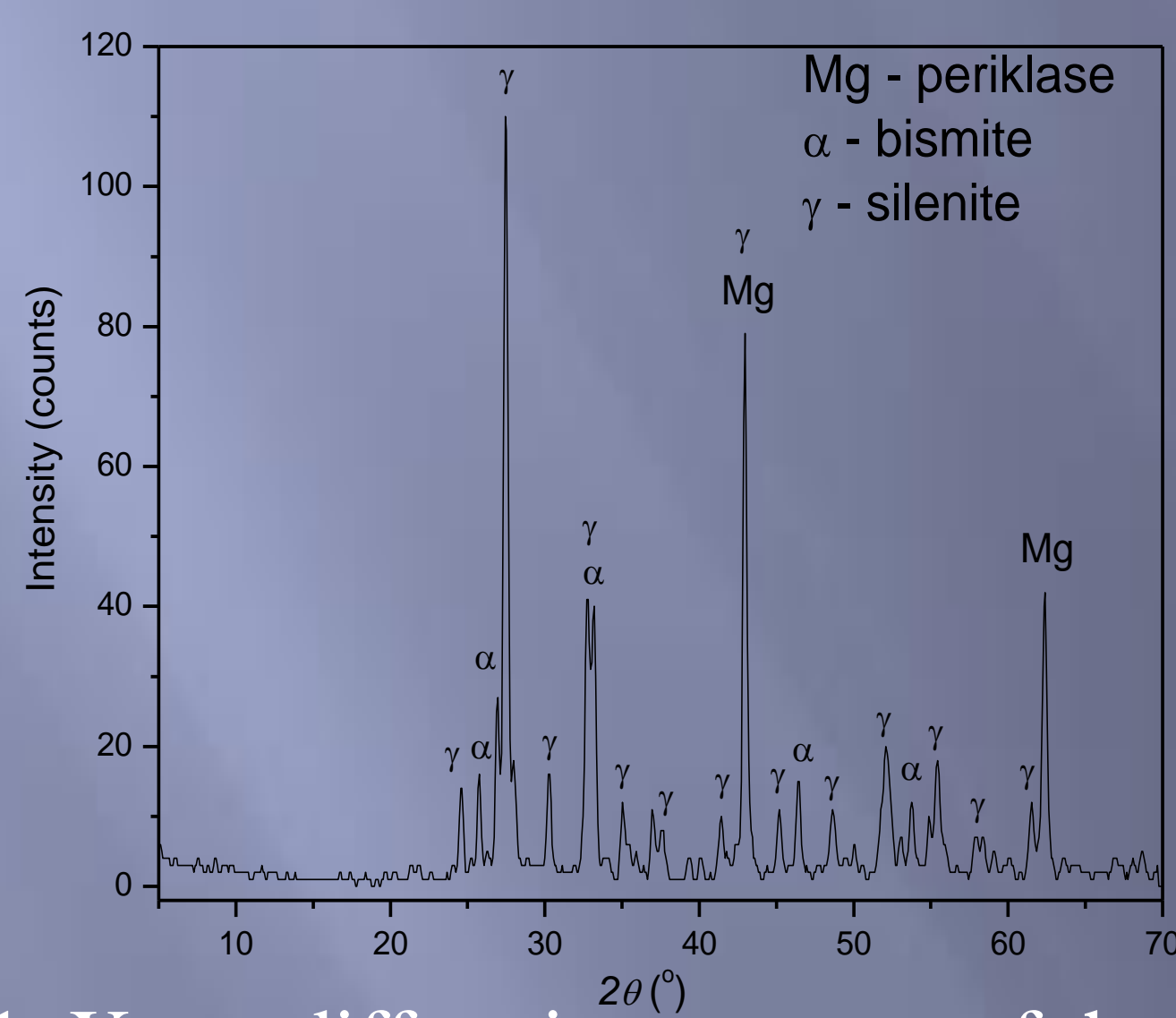


Figure 1. X-ray diffraction patterns of the sample MgO/Bi₂O₃ sintered at 820°C

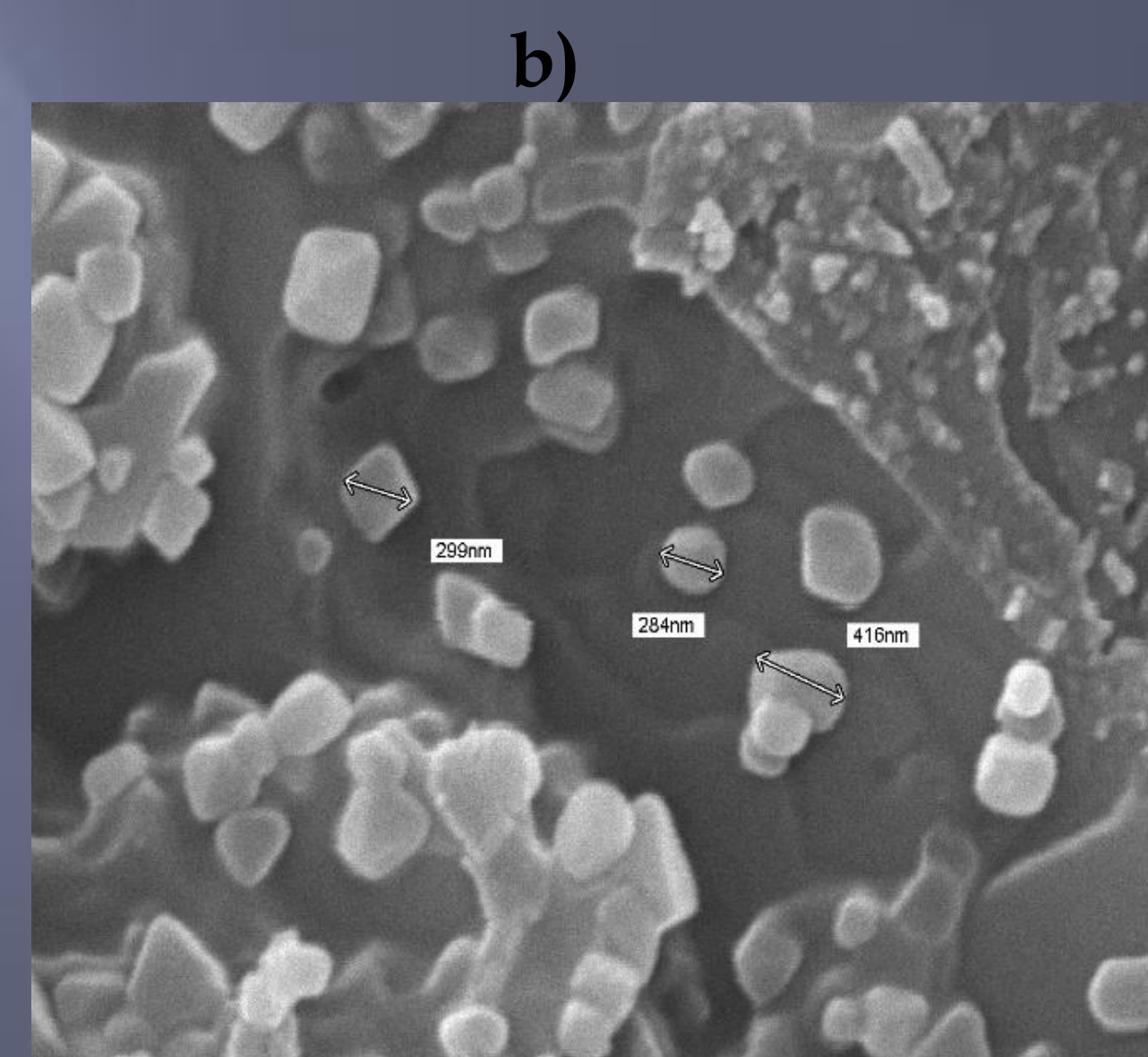


Figure 2. SEM microphotographs of the sample MgO/Bi₂O₃ sintered at 820°C (3000 X)

In the aim of researching the reactions of cordierite synthesis, the binary systems were examined as follows: MgO/Bi₂O₃ sintered at 820°C and 1100°C. The results showed liquid phase in the system at 820°C (the melting temperature of Bi₂O₃) and producing meta-stable compounds that form MgO with Bi₂O₃ at 1100°C. This unstable compound transports through the liquid phase, which allowed (from the two aspects) the acceleration of the reaction in the more-component system.

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