

Ref.: 10-34

Impedance spectroscopy analysis of intergranular phases in cubic zirconia-calcia with boron oxide addition

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The effect of boron oxide addition on the properties of ZrO₂:12.5 mol% CaO ceramic powders and sintered pellets was studied by thermal analysis, powder X-ray diffraction, impedance spectroscopy, and scanning electron microscopy. Zirconia-calcia solid electrolytes sintered with 0.5 mol% B₂O₃ addition shows slight improvement in its apparent density as well as in the value of the ionic conductivity in the electrolytic region. A detailed impedance spectroscopy analysis of pellets sintered with different B₂O₃ additions shows a medium frequency response (between intergranular and intragranular responses) related to an intergranular region modified by liquid phase sintering, also observed by scanning electron microscopy. (CNEN, CAPES, CNPq, PRONEX, FAPESP)

Palavras-chave:

zirconia, boron oxide, impedance spectroscopy