عنوان مقاله:

An investigation of microstructure and properties of magnesia-magnesium aluminate spinel refractory promoted with titania for steel industries

محل انتشار:

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خلاصه مقاله:

Alkaline bricks, especially magnesia refractory products containing spinel, are the most important refractory materials that are used in many refractory industries such as steel, cement and non-ferrous industries due to their special physical, chemical and mechanical properties. In this study, the effect of titania addition on the properties and microstructure of magnesium-alkali refractories without spin-band chromium was studied. After cooking the product samples at two temperatures of ۱۵۰۰ and ۱۶۰۰ °C, different physical and mechanical properties such as density, apparent porosity, cold compressive and flexural strength, load retardation and hot rupture modulus were evaluated according to ASTM standard. The results showed that with increasing titania up to ۶% by weight after sintering at ۱۶۰۰ ° C compared to the reference sample without additive, density and apparent porosity due to the formation of spinel phases and especially magnesium -titanate increased and decreased, respectively. Also, cold compressive and flexural strength increase to ۴% by weight with the addition of this material, and with further increase, cold compressive and flexural strength due to the increase in volume percentage of magnesium- titanate and magnesium aluminate-spinel phases decrease and increase, respectively. The results also show that by increasing the titania up to ۶% by weight compared to the sample without additives, the modulus of hot rupture increases at ۱۰۰۰ and ۱۴۰۰ °C and on the delay under load by increasing the amount of titania to ۲% by weight from temperature T۰ =۱۵۷۰ ºC is added to ۱۶۲۰ ºC under load ۲ Kg / Cm۲.

کلمات کلیدی:

Refractory materials, Magnesia-Spinley refractory, Titania, Steel furnace