عنوان مقاله:

EFFECT OF Si ANTIOXIDANT ON THE RATE OF OXIDATION OF CARBON IN MgO- C REFRACTORY

محل انتشار:

ماهنامه بین المللی مهندسی, دوره 24, شماره 4 (سال: 1390)

تعداد صفحات اصل مقاله: 10

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خلاصه مقاله:

Progressive conversion/shrinking core (PC-SC) models of constant-size cylinders were exploited to interpret the decarburization reactions of MgO-C-Si bricks heated up under blown air. Chemical adsorption/solid (or pore) diffusion mechanisms governed the reaction rate. With ۵% silicon, chemical adsorption vanished at ۱۰۰۰ and ۱۱۰۰ ℃. The oxidation rate lowered then with temperature. This was due apparently to the blocking of the pore-end gorges by the voluminous compounds (like Forstrite). Arrhenius plots of the specific rates yielded the activation energies of the prevailing steps. Without Si antioxidant, three steps were appreciated having activation energies of ۵۱.۶۵ (for chemical adsorption), ۱۲۵.۷۵ (for solid-phase diffusion) and ۹.۰۸ KJ/mol (for pore diffusion). With ۵ wt% silicon addition, two steps existed with activation energies of ۵۱.۶۵ (for chemical adsorption) and ۱۳۴.۵۹ KJ/mol (for solid-phase diffusion). These values were slightly lower than the corresponding activation energies reported earlier for MgO-C and MgO-C-Al systems. .Small differences could apparently attribute to the tortuosity differences of the samples

کلمات کلیدی:

Refractory, MgO-C, Silicon, Antioxidant, Kinetics, oxidation, PC, SC