Improvement the Chemical Resistance of Furnaces Bricks for Petroleum Refineries by ZrO₂-Nano-Glass-Ceramic Coated

Abstract- Partial Stabilized Zirconia (PSZ) was prepared from adding 3 wt% of MgO or adding 8 wt% of Y₂O₃ to 90 wt% ZrO₂ Powder and mixed by wet method, then dried and firing mixture to 1500 °C to obtain PSZ ceramic powder. Glass-Ceramic (Li₂SiO₃) and (LiAlO₂) prepared by dissolve lithium carbonate and lithium hydroxide with Nano-Silica (SiO₂) and Nano-Alumina (Al₂O₃) respectively. Those glass-ceramic mixed with PSZ in different percentage (2.5,5,7.5,10) and sprayed on furnaces bricks for petroleum refineries. An increase in the chemical resistance of the acid on the surface of the Refractory bricks was observed when coating with the glass-ceramic mixture, as well as increasing the hardness and thermal shock resistance. Lithium silicate coated specimens are more spared and homogeneous on the surface compared to lithium laminate coated.

Keywords- Glass-Ceramic; Coating; Partial Stabilized Zirconia; Mohs Scale; Chemical Resistance.