## ABBREVIATIONS AND SYMBOLS

% – Percentage EDS – Energy dispersive X-ray

spectroscopy

© – Copyright gm – Gram(s)

°C – Degree centigrade h – Hour

 $\alpha$ – Alpha HMOR – Hot modulus of rupture

 $\beta$ – Beta Kg – Kilogram

 $\Delta$ – Delta m – Molar

μm – Micrometer min– Minutes

AMC – Alumina magnesia carbon mm– Millimeter

AP – Apparent porosity NCB – Nanocarbon black

BD – Bulk density nm – Nanometer

CCRB – Carbon containing refractory PLCR- Permanent linear change

brick after reheat

CCS – Cold crushing strength sec – Second

cm– Centimeter SEM – Scanning electron

microscopy

CMOR – Cold modulus of rupture TGA – Thermogravimetric analysis

CTE- Coefficient of thermal expansion TSR – Thermal shock resistance

DTA – Differential thermal analysis XRD – X-ray diffraction