^{57}Fe Mössbauer in situ study into oxygen vacancy disorder of BSCF, $(Ba_{0.5}Sr_{0.5})(Co_{0.8}Fe_{0.2})O_{3-\delta}$

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Although air is usually used for fuel combustion, it is well known that oxygen enrichment of combustion air enhances the combustion e ciency. Cryogenic oxygen separation is well established for oxygen production at large scale but its costs are relatively high compared to the economic bene t caused by an improved combustion e ciency. erefore, the development of alternative oxygen separation processes is still an issue. One of the most promising ceramic materials for oxygen separation membranes is the mixed ionic electronic conducting $(Ba_{0.5}Sr_{0.5})(Co_{0.8}Fe_{0.2})O_{3-\delta}$ (BSCF) with its extremely high oxygen vacancy .9 (xyg)8.1 (