The amorphous La-Cr-O thin film was deposited by RF-magnetron sputtering on the stainless steel interconnect material to protect the metallic interconnect against oxidation in an aggressive SOFC environment. A self-assembled dendritic LaCrO₃ structure developed as a result of the amorphous to perovskite structure phase transition during the annealing of the thin film at 700°C for 1 hour in air.