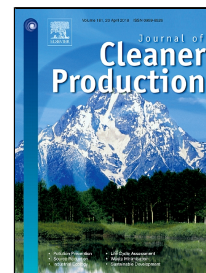


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# **An Assessment of the Longevity of Samarium Cobalt Trioxide Perovskite Catalyst during the Conversion of Greenhouse Gases into Syngas**

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## **Abstract**

Catalytic carbon dioxide (CO<sub>2</sub>) reforming of methane (CH<sub>4</sub>) has gained interest because it reduces the amount of greenhouse gases in the environment. In addition, the products from the reforming process are utilized as feedstock in the Fischer-Tropsch synthesis. However, rapid catalyst deactivation and sintering due to carbon deposition often accompany the CO<sub>2</sub> reforming of CH<sub>4</sub> reaction. In this study, samarium cobalt trioxides perovskite catalyst was synthesized and employed as catalyst in a 72 h longevity test conducted at 1073 K using CO<sub>2</sub> to reform CH<sub>4</sub> with gas-hourly-space velocity of 30,000 h<sup>-1</sup>. Feed ratios (0.5 – 2.0) were varied and excellent catalytic longevity, maximum conversion (above 90 %) and yield (above 60%), were obtained at 1.0 feed ratio. Physicochemical properties of the fresh catalyst revealed uniform metallic particles distribution on a single phase perovskite structure, while spent catalyst showed evidence of carbon which was graphitic at 0.5 –

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