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**O PAPEL DOS MATERIAIS CERÂMICOS NA PRODUÇÃO DE HIDROGÊNIO COM CAPTURA SIMULTÂNEA DE CO<sub>2</sub>**

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Hydrogen is considered one of the most promising alternatives to fossil fuels. However, it is mainly obtained from syngas resulting from natural gas steam reforming (SMR), producing a significant amount of carbon dioxide as a side product. Carbon dioxide emission (CO<sub>2</sub>) is a major contributor to global warming, and one-third of those emissions come from fuel combustion for power generation. A new interesting process has been described to control CO<sub>2</sub> emission: the reforming optimized by CO<sub>2</sub> sorption, which associates conventional methane reforming and in situ capture of CO<sub>2</sub> via absorption in a solid oxide. Furthermore, this strategy can increase the H<sub>2</sub> production and concentrate CO<sub>2</sub> for the eventual use as chemicals or energy vectors. Alkaline and alkaline-earth ceramics have been proposed for CO<sub>2</sub> capture through adsorption and chemisorption processes. These materials can be classified into two large groups: dense and porous ceramics. Dense ceramics mainly trap CO<sub>2</sub> chemically: the CO<sub>2</sub> is chemisorbed. Among these ceramics, CaO is the most studied one. CaO-based materials have been highlighted as the solid sorbents in the capture of CO<sub>2</sub> because of their favorable thermodynamic and chemical properties. The main problem with CaO is the strong decrease in the sorption capacity after multiple carbonation–calcination cycles. This talk will cover some strategies to improve this sorption capacity, such as the deposition of calcium oxide on an inert support, Ca<sub>12</sub>Al<sub>14</sub>O<sub>33</sub> (mayenite). This oxide has no sorption properties but presents a large surface area, and provides stable network inhibiting deactivation of CaO by sintering.