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Hydrogen by sorption enhanced methane reforming: a grain model to study the behavior of bi-functional sorbent-catalyst particles

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KEYWORDS:
Sorption enhanced steam methane reforming; Bi-functional particle grain model; Sorbent-catalyst particle isothermal behavior; Sorption activity decay in cyclic operation.

ABSTRACT:
This work utilizes a previously developed particle grain model (PGM) for carbon dioxide CaO-based sorbents, properly integrated to describe numerically the behavior of a single particle where some catalytic activity is combined to the sorption function. In this way, the model capability is extended to the investigation of a bi-functional sorbent-catalyst particle for sorption enhanced steam methane reforming (SE-SMR) processes to produce hydrogen.