# Strategy for greenhouse gases conversions via reforming and chemical looping technology

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To convert main greenhouse gases such as $CH_4$ and $CO_2$ to syngas or value-added chemicals, various technologies have been reported including reforming reactions or direct conversion technology. In the present study, Ni-based or Fe-based heterogeneous catalysts were investigated to enhance their thermal stability for the production of syngas as well as petrochemicals through reforming or chemical looping processes. In general, metal nanoparticles having a comparable activity as novel metals can be easily sintered to form less active and bigger agglomerates with more facile coke deposition natures. To increase the thermal stability of the metal nanoparticles, some efficient modification methods with structural promoters on various supports such as basic components or multi core-shell structures such as Ni-Co@$SiO_2$ or Fe@$Al_2O_3$ systems were investigated for dry reforming and chemical looping processes, and the strategies to enhance the thermal stability of metal nanoparticles with less aggregations and to suppress the coke formations on the active sites.