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(54) Title: CATALYSTS AND METHODS FOR METHANE DEHYDROGENATION

105 Heat calcine silica gel at 900 °C
for one hour

FIG. 1

(57) Abstract: The present application pertains to a methane dehydrogenation process
subjecting a methane feed to a novel SiO₂ catalyst under dehydrogenation conditions
and producing hydrogen, ethylene, an aromatic, or any mixture thereof. In another em-
bodiment, the present application pertains to a novel catalyst for methane dehydrogena-
tion. The catalyst comprises amorphous particles of SiO₂. The amorphous particles have
a particle size with a nominal diameter of from about 5 nm to 1 cm. The amorphous
particles of SiO₂ comprise a Lewis acidity sufficient to activate one or more C-H bonds
in methane and generate one or more methyl radicals when the catalyst is subjected to
methane dehydrogenation conditions. In another embodiment, the present application per-
tains to method of making the novel catalyst for methane dehydrogenation.

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