

**CATALYST AND PROCESS OF HYDROCARBON FEEDSTOCK  
REFORMATION TO HYDROGEN AND CARBON MONOXIDE**

**ABSTRACT OF THE DISCLOSURE**

**[0043]** A catalytic composition is particularly well suited for hydrocarbon conversion to synthesis gas at a temperature of between 800 and 1000° Celsius. The catalytic composition includes a noble metal cluster having an X-Y-Z axial mean linear dimension of between 2 and 15 Angstroms and a super cage structure surrounding the noble metal cluster. The super cage structure stabilizes the noble metal cluster against aggregation at temperatures of 1000° Celsius. A process for reforming hydrocarbon feedstock to hydrogen and carbon monoxide is also provided that conversion to greater than 80% of theoretical yield.