

NO_x Abatement by CO with the Use of Grain Catalysts with Active Coating Made of Transition Metal (Cu, Mn, Nb) Oxides Prepared by Electroless Chemical Deposition Method

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Abstract : It is well-known that, despite the constant increase of alternative energy sources usage, today combustible fuels are still widely used in power engineering. As a result of fuel combustion, significant amounts of nitrogen oxides (NO_x) and carbon monoxide (CO is a product of incomplete combustion) are supplied to the atmosphere. Also, these pollutants are formed in industry (chemical production, refining, and metal production). In this work, the investigation of nitrogen oxides CO-selective catalytic reduction using new grain load-type catalysts was carried out. The catalysts containing the substrate and a thin active coating made of transition metal (Mn, Cu, and Nb) oxides were prepared with the use of electroless chemical deposition method. Chemical composition, chemical state, and morphology of the formed active coating were investigated using ICP-OES, EDX, SEM, and XPS techniques. The obtained results revealed that the prepared catalysts (Cu-Mn-oxide and Cu-Mn-Nb-oxide) have rough and developed surface and can be successfully used for the flue gas catalytic purification. The significant advantage of prepared catalysts is their suitability from technological application point of view, which differs this work from others dedicated to gas purification by SCR.

Keywords : flue gas, nitrogen oxides, selective catalytic reduction, transition metal oxides

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