**Advanced mixed metal oxides in catalytic oxidation of VOCs in air**

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Volatile organics (VOCs) are extensively utilized in a broad spectrum of applications and their emission control has become an integral part of an environmental policy of manufacturers and companies handling them in various industrial activities. There are several methods to reduce VOCs releases into atmosphere as activated carbon adsorption, biofiltration, thermal oxidation or catalytic oxidation. Catalytic oxidation is the advanced form of thermal oxidation, since it uses heterogeneous catalysis to decrease efficient temperature of contaminant oxidation leading to significant energy savings in waste air treatment. Its application may also provide many other practical benefits as compared to other traditional technologies of VOCs abatement. However, the use of high performance, resistant and low-cost catalysts are required for further expansion of the technology to industry. Recent researches have been focused on the development of innovative materials based on transition metal oxides, such as Co, Cu or Mn oxides, as substitutes to expensive precious metal catalysts.

In this contribution, the results of laboratory pre-scaled up continuous experiments of oxidation of several VOCs are presented using the series of innovative mixed metal oxides. These hydrotalcite-like materials composed of various mixed structures of Co, Cu, Mn, Mg or Fe oxides were prepared by co-precipitation method in amounts of up to several tens of grams, and then, tested in fixed bed reactor. We measured catalytic activities as conversion of five VOCs representatives in temperature range up to 350 °C. Moreover, during the experiments, the influence of air flowrate, air humidity, contaminant concentration or competitiveness was evaluated too. The very promising activities were achieved for Co-Mn hydrotalcite structure of which contaminant conversions are comparable with those of conventional Pd or Pt supported catalysts for which it can be cost-effective powerful alternative. These results are planned to be verified in pilot scale at the end of this year.