Musialik-Piotrowska, A. Activity of Perovskite-Based Platinum Doped Catalysts in Oxidation of Organic Air Pollutants. *Ochrona Srodowiska* 2011, Vol. 33, No. 1, pp. 19–24.

Abstract: Metal oxide perovskite-type catalysts usually show high activity for oxidizing oxy-derivative compounds, but they are much less active in the oxidation of hydrocarbons, particularly aromatics. For the purpose of the study, $LaMnO_3$-based catalysts, with platinum incorporated into the active phase, were prepared on monolithic metallic supports washcoated with γ-Al_2O_3. The catalysts were tested in the oxidation of toluene, as well as acetone and ethyl acetate, which were combusted separately or in two-component mixtures – hydrocarbon and oxy-derivative. It has been demonstrated that when toluene alone was oxidized, the reaction ran to final products – CO_2 and H_2O, while oxygen compounds were oxidized via intermediate products – acetaldehyde during combustion of both compounds, and ethanol during combustion of ethyl acetate. With all the catalysts tested, the "mixture effect" of each component was insignificant during oxidation of the toluene-acetone mixture, and noticeably stronger during combustion of the toluene-ethyl acetate mixture. The combustion of toluene in mixtures over catalysts of lower activity occurred *via* benzene. In the presence of Pt-doped catalysts, the concentration of acetaldehyde during combustion of mixtures decreased, which was probably due to a local rise in temperature on the Pt active sites as a result of toluene oxidation. The highest activity was that of the catalyst where platinum was deposited onto γ-Al_2O_3, and the total content of the active phase amounted to 20 wt. %. It has been found that in the case of metal oxide catalysts the minimal content of the active phase can not be lower than 15 wt. %.

Keywords: Organic air pollutants, toluene, acetone, ethyl acetate, catalyst, perovskite, platinum.