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ABSTRACTS

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O5-7
Fe-laponite as heterogeneous photo-Fenton catalyst for phenol degradation in water

B. Iurascu[1], I. Siminiceanu[1], D. Vione[2], M.A. Vicente[3] and A. Gil[4]
[1]Facultatea de Inginerie Chimica, Universitatea Tehnica"Gh. Asachi", Iasi, Romania. [2]Dipartimento di Chimica Analitica, Università di Torino, Via P. Giuria 5, I-10125 Torino, Italy. [3]Departamento de Química Inorgánica, Universidad de Salamanca, E-37008 Salamanca, Spain. [4]Departamento de Química Aplicada, Universidad Pública de Navarra, E-31006 Pamplona, Spain.Corresponding author: M.A. Vicente, mavicente@usal.es

New photo-Fenton catalysts were prepared from Fe-oligomers and synthetic layered clay laponite. They were used for photo-Fenton conversion of phenol at 30°C. Optimal conditions were: UV-C radiation; pH 3; 1 $g_{catalyst}$/L, and concentrations 50 mM for H_2O_2 and 1 mM for phenol. The catalyst prepared from thermally-aged Fe-polycations and calcined at 350 ºC showed the best performance. Kinetic studies showed that the reaction *phenol à intermediates* is about three times slower than *intermediates à* CO_2 + H_2O. Thus, monitoring the conversion of phenol is not enough; TOC should also be carefully analysed, to avoid the occurrence of dangerous intermediates.

O5-8
Optimization of multicomponent oxide catalyst for low temperature N_2O abatement– synergy of bulk and surface double doping

P. Stelmachowski[1], G. Maniak[1], F. Zasada[1], W. Piskorz[1], A. Kotarba[1], Z. Sojka[1], M. Inger[2], M. Wilk[2],
[1]Faculty of Chemistry, Jagiellonian University, Krakow, Poland. [2] Instytut Nawozow Sztucznych, al.1000-lecia Panstwa Polskiego 13A, 24-110 Pulawy, Poland. sojka@chemia.uj.edu.pl

A strong promotional effect of successive promotion of Co_3O_4 host by Zn and K was observed for N_2O decomposition in dry and wet conditions. The catalytic activity was clearly correlated with the work function of the catalyst surface. Single bulk doping of the spinel with Zn ions is less efficient than the surface doping with potassium, whereas the double doping results in a synergetic effect leading to decrease of the $T(X = 50\%)$ value by 200°C. The DFT studies revealed that whereas the Zn bulk doping modifies the DOS characteristics the beneficial effect of K consist in formation of surface dipoles lowering the work function of the catalyst.

Keywords: DeN_2O, work function, Co_3O_4

O5-9
Structured Metal-Zeolite Catalysts for the Catalytic Combustion of VOCs

E. R. Silva[(a)*], J.M. Silva[(b)], M.F. Vaz[(c)], F.A. Costa Oliveira[(d)], F.R. Ribeiro[(a)], M.F. Ribeiro[(a)]
*[(a)] IST-Instituto Superior Técnico, IBB, Av. Rovisco, 1049-001 Lisboa, Portugal; [(b)] Instituto Superior de Engenharia de Lisboa, R. Cons. Emídio Navarro, 1959-007 Lisboa, Portugal; [(c)] IST, ICEMS, Av. Rovisco Pais, 1049-001 Lisboa, Portugal; [(d)] Instituto Nacional de Engenharia, Tecnologia e Inovação, I.P., Estrada Paço do Lumiar, 1649-038 Lisboa, Portugal; *Corresponding author e-mail: elisabetesilva@ist.utl.pt*

Recently, structured catalyst foams have revealed attractive improvements in terms of efficiency of catalytic combustion. Their highly porous three-dimensional network of open cells can provide some advantages when compared to conventional monoliths. In this work, cordierite foams and monoliths were washcoated with $Cu_{(1.6)}$MFI and $Pt_{(0.1)}$MFI zeolites. Uniform and well-adherent coatings were obtained for zeolite contents around 5-12 wt.%. The catalytic performances of both structured catalysts were evaluated in the deep oxidation of toluene. Decreases of about 10 ºC on the light-off temperature have been observed for the coated foams when compared with monoliths. This can be attributed to hydrodynamic and both axial and radial mixing/turbulence effects provided by the tortuous network of the foam leading to improvements on mass and heat transfers.

Keywords: VOC combustion, Structured catalysts, Cu and Pt zeolites