

Title: Catalytic combustion of toluene on Pt zeolite coated cordierite foams

Author(s): Ribeiro, Filipa¹; Silva, João M.²; Silva, Elisabete¹; Vaz, M. Fátima³; Oliveira, Fernando A. C.⁴

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Abstract: The catalytic properties of Pt based cordierite foam catalysts have been evaluated in catalytic combustion of toluene (800 ppm in air). The catalysts contain identical Pt content (0.1%) which was introduced by three different ways: Pt ion exchange on MFI zeolite and then coating on the foam; Pt ion exchange after zeolite coating and finally Pt directly wet impregnated on the cordierite foam. The catalytic behaviour of Pt foam based catalysts was compared with that of PtMFI zeolite under powder form. Pt exchanged MFI supported on the cordierite foams present an improvement of activity for toluene combustion of about 50 degrees C on the light off temperature (T-50%).

The enhanced performance of the structured catalysts is due not only to the open structure of foams and homogeneous thin layers catalyst deposited on their cell walls, but also to the fact that the size and location of Pt particles present in MFI zeolite are changed during the dipping step. Indeed, as prepared Pt samples and those used in the preparation of the slurry were observed by transmission electron microscopy revealing that the chemical interaction of PtMFI zeolite with the binder and detergent, both present in the slurry, leads to an increase of Pt particles size which were found to migrate from internal pores to the external surface of zeolite crystallites thereby increasing catalytic activity. (C) 2011 Elsevier B.V. All rights reserved.

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Reprint Address: Ribeiro, F (reprint author), Inst Super Tecn, Dept Chem Engn, IBB Ctr Biolog & Chem Eng, Av Rovisco Pais, P-1049001 Lisbon, Portugal.

Addresses:

1. Inst Super Tecn, Dept Chem Engn, IBB Ctr Biolog & Chem Eng, P-1049001 Lisbon, Portugal
2. Inst Super Engn Lisboa, Dept Chem Engn, P-1959007 Lisbon, Portugal
3. Inst Super Tecn, Dept Mech Engn, ICEMS, P-1049001 Lisbon, Portugal
4. Lab Nacl Energia & Geol IP, Prod Engn Unit, P-1649038 Lisbon, Portugal

E-mail Address: filipa.ribeiro@ist.utl.pt

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